# TO ASSESS THE BASELINE CHARACTERISTICS AND ADVERSE OUTCOMES IN PATIENTS WITH ACUTE CORONARY SYNDROMES

*Dissertation submitted to*

**THE TAMILNADU Dr. M.G.R. MEDICAL UNIVERSITY**

*In partial fulfilment of the regulations for the award of the degree of*

**M.D. GENERAL MEDICINE (BRANCH – I)**

**INSTITUTE OF INTERNAL MEDICINE**

**MADRAS MEDICAL COLLEGE**

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**CHENNAI**

**APRIL 2013**

# CERTIFICATE

This is to certify that this dissertation entitled "**TO ASSESS THE BASELINE CHARACTERISTICS AND ADVERSE OUTCOMES IN PATIENTS WITH ACUTE CORONARY SYNDROMES"** is a bonafide work done by **Dr. S. RAMARAJAN,** Post Graduate Student, Institute of Internal Medicine, Madras Medical College, Chennai – 3 in partial fulfilment of the University Rules and Regulations for the award of M.D. Branch – I General Medicine, under our guidance and supervision, during the Academic period from May 2012 to November 2012.

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# DECLARATION

I, **Dr. S. RAMARAJAN** solemnly declare that the dissertation entitled "**TO ASSESS THE BASELINE CHARACTERISTICS AND ADVERSE OUTCOMES IN PATIENTS WITH ACUTE CORONARY SYNDROMES**" is done by me at Madras Medical College, Chennai – 3 during the period May 2012 to November 2012 under the guidance and supervision of **Prof. R.PENCHALAIAH M.D.** to be submitted to The Tamilnadu Dr. M.G.R. Medical University towards the partial fulfilment of the requirements for the award of M.D. DEGREE (Branch - I GENERAL MEDICINE).

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## ACKNOWLEDGEMENT

I thank my beloved Dean, **PROF. V. KANAGASABAI M.D.** for having given me permission to conduct this study and allowing me toutilize the resources of Madras Medical College and Rajiv Gandhi Government General Hospital, Chennai.

I express my sincere gratitude to my beloved Professor and Director, Institute of Internal Medicine **PROF. N.RAGHU M.D.** for his guidance and encouragement in making this work complete.

I express my heartfelt gratitude and indebtedness to my beloved chief, **PROF.R.PENCHALAIAH M.D.** for his profound insight, motivation, advice and valuable criticism which enabled me to complete this work.

I am extremely thankful to my Assistant Professor of Medicine, **Dr. S. SIVARAMKANNAN M.D.** for his co-operation, advice and guidance in carrying out this work.

I express my heartfelt gratitude to **PROF.V.E.DHANDAPANI, M.D.,D.M.,** Director, H.O.D Department of Cardiology for his, timely advice and guidance in carrying out this work.

I would always remember with extreme sense of thankfulness the co-operation and criticism shown by my colleagues without whose help I would not have achieved completion of this work.

Last but not the least, I would wish to thank all the patients without whose kind cooperation and generosity, this study would not have been possible.

# CONTENTS

# INTRODUCTION

# INTRODUCTION

ISCHEMIC HEART DISEASE occurs when there is a mismatch between the myocardial oxygen supply and demand. Atherosclerosis involving the epicardial coronary arteries is the most common cause of ischemic heart disease, which decreases the perfusion and oxygen supply to the area of the myocardium supplied by that arterial territory. Ischemic heart disease poses a major economic burden both in the developed and as well as in the developing countries. Many factors like sedentary lifestyle, smoking, genetic factors, eating a high fat diet are associated with the new onset of ischemic heart disease.

Aging is one of the non-modifiable risk factors for the ischemic heart disease. The WORLD HEALTH ORGANISATION estimated the average life- expectancy to be 73 years by the year 2025. The older population in the developing countries like ASIA is likely to double and will account for 10% of their populations [1]. GOYAL and YUSUF et al reported the prevalence of diabetes as 11.8% and 3.8% in the urban and rural areas respectively in the south Asia during the year 2006 [2]. Diabetes mellitus accounts for the 11.8% of myocardial infarctions by the INTERHEART STUDY [2].

Prevalence of systemic hypertension is reported to be 20 – 40% and 12-17% respectively among the urban and rural population in INDIA [1].

Systemic hypertension accounts for the 19.3% of myocardial infarctions by the INTERHEART STUDY[3]. It is estimated that26% of the adults are current smokers worldwide [4]. In India it is estimated that about 40 % of men are current smokers [5]. Tobacco usage is one of the modifiable risk factors for the ischemic heart disease. Elevated cholesterol levels accounts for the 56% of the ischemic heart disease and 18% of strokes globally. Obesity is evolving as one of the major risk factors for ischemic heart disease globally. Obesity has been attributed to the life-style changes such as eating unhealthy foods, high fat diet, physical inactivity and the urbanization.

Patients with ischemic heart disease are classified into two types. Two types include Patients with Coronary Artery Disease (CAD) who commonly presents with stable Angina and Patients with Acute Coronary Syndromes (ACSs). Patients with acute coronary syndromes comprise of patients who present with ST segment Elevation myocardial infarction, unstable angina and Non ST Elevation myocardial infarction.

Complications of myocardial infarction include ventricular dysfunction, cardiogenic shock, right ventricular infarction, arrhythmias, recurrent chest discomfort, pericarditis, thromboembolism, ventricular aneurysm and sudden cardiac death.

Management strategies for unstable angina and Non ST elevation MI include medical treatment, anti ischemic treatment and antithrombotic therapy. Management of ST-ELEVATION MI include antithrombotic therapy, percutaneous coronary intervention, fibrinolysis, beta-adrenoreceptor blockers, Angiotensin converting enzyme inhibitors and supportive treatment include inotropic agents, vasodilators and diuretics for acute pulmonary edema, and anti-arrhythmics for arrhythmias. Secondary preventive measures include long term anti-platelet therapy with aspirin, or with clopidogrel in patients who are intolerant to aspirin.

ACE Inhibitors, Angiotensin receptor blockers, aldosterone antagonists should be prescribed for patients with clinically evident heart failure, a moderate reduction in the ejection fraction or patients with large regional wall motion abnormality in order to prevent the ventricular remodelling after myocardial infarction. Management of risk factors is of utmost importance to prevent the future ischemic events.Finally rehabilitation is recommended for patients with advanced cardiac disease.

This study mainly focuses upon the baseline characteristics of patients with acute coronary syndromes (ACSs) and to assess the adverse outcomes such as Re-infarction, heart failure, dilated cardiomyopathy, arrhythmias, conduction disturbances, recurrent events and death in patients who got admitted to Rajiv Gandhi Government General Hospital with the diagnosis of acute coronary syndromes, so that further refinements in management can be done and patient's survival and quality of life can be improved.

# AIMS AND OBJECTIVES

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## AIM

Main aim is to assess the baseline characteristics of patients with acute coronary syndromes and to assess the adverse outcomes in patients who present with acute coronary syndromes, so that management of patients with myocardial infarction can be made effective to prevent the recurrences.

## OBJECTIVES:

A) To assess the cardiovascular morbidity and mortality in patients with acute coronary syndromes.

B) To assess the prognosis of patients who presented with acute coronary syndromes during the follow up period of 6 months.

C) To quantify the usefulness of baseline characteristics as prognostic factors in patients with acute coronary syndromes.

D) To categorize the patients in the future so that strategies can be made to prevent the future recurrences.

# REVIEW OF LITERATURE

# REVIEW OF LITERATURE

THYGESEN et al [6].Defined the diagnosis of Myocardial infarction in ESC (EUROPEAN SOCIETY OF CARDIOLOGY)expert consensus document that when any one of the following criteria are met along with the rise /fall of cardiac biomarkers.

1. when the patient present with symptoms suggestive of ischemia, electrocardiographic changes suggestive of ischemia such as ST –T changes, new onset LBBB (left bundle branch block), appearances of pathological Q wave in electrocardiogram, imaging wise of loss of viable myocardium or regional wall motion abnormality along with the rise of cardiac biomarkers with at least one value above the $99^{th}$ percentile of upper reference limit of normal.

2. In patients with unexpected death due to sudden cardiac arrest accompanied by symptoms of ischemia, and by Electrocardiographic (ECG) changes of ischemia, new onset of LBBB, evidence of fresh thrombus by coronary angiography, or occluded coronary thrombus during autopsy.

3. For peri-procedural myocardial necrosis following percutaneous coronary intervention the elevation of cardiac bio-markers especially creatinine kinase MB 3x URL (upper reference limit of normal).

4. Following CABG (coronary artery bypass grafting) the diagnosis of myocardial infarction is suspected when there is 5x times elevation of the cardiac bio-markers of URL and coronary angiographic evidence of new coronary artery graft or native coronary artery occlusion.

5. Pathological findings of acute myocardial infarction.

**Clinical features of myocardial ischemia:**

Term myocardial infarction denotes the death of cardiac myocytes due to the imbalance between oxygen demand and supply. Patients with myocardial ischemia present with symptoms of chest discomfort, diffuse chest pain which may radiate to inner aspect of left arm, jaw and usually accompanied by diaphoresis, palpitation, breathlessness, syncope and accompanied by sense of impending doom.

Symptoms are non- specific because it can occur in an array of gastrointestinal, musculoskeletal, respiratory and neurological disorders. Patients can present even without chest pain, due to silent ischemia in diabetics. Patient can present with ECG changes, elevation of cardiac bio-markers or with imaging changes.

## PATHOLOGICAL CHANGES IN PATIENTS WITH MYOCARDIAL INFARCTION:

If the blood supply to the myocardium is restored within 30 minutes the viability of myocardium can be restored. If there is a delay in Management beyond that reversibility period, Patient may develop myocardial necrosis mainly coagulative necrosis. Myocardial infarction can be classified pathologically based on the size.

1. Small if < 10 % of the left ventricular myocardium is affected microscopically.
2. Moderate when 10 – 30 % of LV myocardium is affected.
3. Large when > 30 % of LV myocardium is affected.

PHASES OF MYOCARDIAL INFARCTION PATHOLOGICALLY:

1. EVOLVING PHASE- < 6 hrs.
2. ACUTE PHASE- 6 hrs – 7 days.
3. HEALING PHASE-7 – 28 days.
4. HEALED PHASE – beyond 28 days.

Timing of clinical symptoms, ECG changes may not correlate with Pathological changes.

## CLINICAL CLASSIFICATION OF MYOCARDIAL INFARCTION [6]

1. Type 1- spontaneous myocardial infarction due to rupture of plaque, Plaque fissuring or erosion.

2. Type 2- secondary to increased oxygen demand or decreased supply secondary to coronary embolism, coronary artery spasm, anemia, hypotension or hypertension.

3. Type 3- In patients with unexpected death due to sudden cardiac arrest accompanied by symptoms of ischemia, and by Electrocardiographic (ECG) changes of ischemia, new onset of LBBB, evidence of fresh thrombus by coronary angiography, or occluded coronary thrombus during autopsy but death occurring before blood samples could be obtained.

4. Type 4a- Peri-procedural MI following percutaneous coronary intervention.

5. Type 4b –myocardial infarction associated with stent thrombosis documented by angiography or at autopsy.

6. Type 5- Myocardial infarction associated with Coronary artery Bypass grafting.

## ECG CHANGES IN PATIENTS WITH MYOCARDIAL INFARCTION

1. ST segment elevation in at least two contiguous leads with the voltage criteria of 0.2 mV in men and 0.15 in women in the precordialleads $v_2$ and $v_3$and 0.1 mV in other leads which is of new onset.

2. ST segment depression and t wave changes with voltage criteria for ST segment depression being 0.05mV and 0.1 mV for t wave changes in atleast two contiguous leadswhich is of new onset.

## CARDIAC BIO-MARKERS:

Cardiac bio-markers can be grouped into three [7].

1. Markers of myocardial ischemia.
2. Markers of myocardial necrosis.
3. Markers of cardiac damage/stress.

**Markers of myocardial ischemia include;**

**a.** H-FABP- HEART TYPE FATTY ACID BINDING PROTEIN.

**b.** IMA- ISCHEMIA MODIFIED ALBUMIN.

**c.** BNP- B-TYPE NATRIURETIC POLYPEPTIDE.

**d.** NT-pro BNP- N-TERMINAL BNP.

**Markers of cardiac necrosis**:

1. cTn- cardiac troponin.
2. Ck-MB- creatinine kinase MB.
3. Myoglobin.

**Markers of stress/stretch include**:

1. ADM- adrenomedullin.
2. BNP/NT- pro BNP - B- type natriuretic polypeptide
3. COPEPTIN- arginine vasopressin axis.
4. GDF-15 growth differentiation factor 15.

Although there are different class of cardiac bio-markers some markers are used for diagnostic and some markers are used for prognostication.

Markers used for risk –stratification in myocardial infarction include

1. BNP/NT- pro BNP.
2. Growth differentiation factor -15.

Several studies which utilised the BNP/NT pro BNP include for risk stratification in MI include.

a. ACS, TIMI -16[8].
b. AMI- CONSENSUS [9].
c. NSTEACS [10].

d. FRISC II[11].

e. TACTICS – TIMI -18[12].

Studies which utilized the GDF -15 as risk stratification in MI include.

a. GUSTO IV [13].

b. ASSENT -2[14].

Though there are different biomarkers available in the market, Most widely used cardiac bio-marker is cardiac troponin.

CkMB is used for the diagnosis of peri-procedural Myocardial Infarction, after percutaneous coronary intervention.

Patients with acute coronary syndromes can present with cardiogenic shock, ventricular dysfunction, arrhythmias, sudden cardiac death, thrombo-embolic events, recurrent chest discomfort, complete heart block, pericarditis, dilated cardiomyopathy, left ventricular aneurysm and ventricular septal rupture.

1. Long term prognosis following myocardial infarction involving 1000 subjects who had myocardial infarction wasstudiedretrospectively, from January 1983 – December 1987 by KYSMI STUDY GROUP [15]. Overall mortality due to cardiac causes was 5% and event rate was 35%.

2. Cardiac failure in a patient with acute coronary syndrome carries a poor prognosis [16].

3. The death rate among patients with unstable angina presenting with Heart failure is 4 x times higher when compared to patients without heart failure in unstable angina [17].

4. The GLOBAL REGISTRY OF ACUTE CORONARY EVENTS [GRACE][18] did a large observational study to assess the impact of in-hospital revascularization on survival in patients with NON ST elevation acute coronary syndrome and with congestive heart failure Between April 1999 and June 2007.

   The study involved 29, 844 patients with NON STEACS enrolled in 120 hospitals and about 4953 patients had congestive heart failure on presentation. In patients who presented with cardiac failure about $1/5^{th}$ of them underwent revascularisation. 35 % of patients with cardiac failure were treated with medications based on evidence based medicine. They were followed up for a period of 6 months, the death rate was low in patients who underwent in-hospital revascularization in patients with NON-STEACS than when compared to patients who were managed conservatively, even after adjustment for GRACE risk score ,$p < .005$.

   A Statistically significant one and they suggested revascularization procedure for small proportion of patients with NONSTEACS.

5. Systemic hypertension is a known risk factor for the coronary artery disease [19, 20].

6. F. GUSTAFFSON, L.KOBER et al [21]. Conducted a study to assess the relationship of systemic hypertension on the prognosis of myocardial infarction. This study involved 6676 patients with myocardial infarction based on the survival data of patients who were screened for entry into TRAandolapril Cardiac Evaluation (TRACE) study. During the observation period 50.6% of hypertensives died compared to 43.7% normotensives. Risk ratio of 1.3, mortality was more in patients aged >65 years.

7. We all know that obesity is a risk factor for ischemic heart disease. Overweight is defined as BMI of >25kg/$m^2$ and obesity is defined as BMI>30kg /$m^2$ [22, 23]. Waist circumference of > 102 cm in men and > 88 cm in women are the risk factors for ischemic heart disease.

8. In contrary to the belief that obesity is associated with an increased risk of ischemic heart disease. Studies have proven that it is not so, in contrary, it has an inverse relationship with cardiac disease. This is described as obesity paradox [24].

9. ZELLER et al [25] studied a cohort of 2229 patients with acute myocardial infarction mainly to assess the relationship of obesity and mortality in patients with acute myocardial infarction. In the study group about 50% were overweight , 25 % were obese and about 50 % had increased waist circumference, in his cohort he reported that obesity was not significant predictor of mortality and raised waist circumference was also not a significant predictor of mortality.

10. This reversal relationship of obesity as a predictor of mortality is exhibited in patients with advanced heart failure and patients who are on Hemodialysis [26]. Patients with obesity have high metabolic reserve that safe guard them against inflammation which is seen in patients with acute myocardial infarction or heart failure [27].patients with BMI on higher side are at low risk of cardiac cachexia when compared to patients with normal BMI or overweight individuals.

The neurohormonal profile i.e the B-Type natriuretic polypeptide level in patients with obesity is low, which is responsible for relatively a good prognosis when compared to patients with elevated B type natriuretic polypeptide.

11. Regular exercise is being recommended in patients with heart failure and high BMI along with raised waist circumference, because exercise improves the local anti inflammatory activity and anti catabolic effects in skeletal muscle in addition to the reduction of visceral adipose tissue [28, 29, 30] .

12. The relationship between alcohol and cardiovascular outcomes had been studied in different studies.

13. The ONSET STUDY [31]. LYON DIET HEART STUDY [32],THE SURVIVAL AND THE VENTRICULAR ENLARGEMENT TRIAL [33], SHEEP STUDY [34] were the studies conducted to find out the association of alcohol with the long term prognosis following acute myocardial infarction.

14. The conclusion of the SHEEP STUDY [34] was alcohol intake was associated with all cause cardiac mortality and morbidity after a myocardial infarction. Patients who quitted recently had the worst prognosis when compared to patients who had long term abstinence of alcohol.

15. The relationship of alcohol with cardiovascular outcomes has been attributed to the favorable effect of alcohol on HDL –Cholesterol.

16. Alcohol intake decreases the fibrinogen level. It did notincrease the level of PAI-1 platelet activation inhibitor and tissue Plasminogen activator (tPA) [35].

17. The association of diabetes mellitus with the ischemic heart disease has been clearly explained by the Framingham heart study [36, 37].

18. I.GUSTAFFSON et al [38] conducted studies to find out the association of long term prognosis of diabetic patients with myocardial infarction.

19. The mortality was 46.4% in non –diabetic populations during the follow up period of 7 years compared to 62.4% in diet treated diabetic populations.

20. The mortality was 73.4% in patients treated with oral hypoglycemic agents when compared to 78.6 % in insulin treated diabetic patients which was statistically significant $p<0.001$.

21. The heart failure incidence is more in diabetic patients when compared to non-diabetics.

22. I.GUSTAFFSON et al [38] reported that 51.2% of non- diabetic population had heart failure as supposed to 72.3% in diabetic patients on meal plan. 66% of diabetics treated with oral hypoglycemic agents had heart failure compared to 72.1% of insulin treated diabetics, which was statistically significant P =0.001.

23. The mechanisms for heart failure in diabetics postulated are possibly due to less aggressive treatment in diabetics with thrombolytic agents and due to diabetes associated arteriolosclerosis affecting the small coronary vessels and myocardial fibrosis [39].

24. DIGAMI [40, 41] study reported the cardiovascular mortality is less in diabetic patients who were treated intensively with insulin during the infarction and 3 months post myocardial infarction period.

25. NATIONAL CHOLESTEROL EDUCATION PROGRAM AND ADULT TREATMENT PANEL III IN 2001(NCEP – ATP III)[42] Guidelines has put forth the criteria for metabolic syndrome as the presence of 3/5 of following criteria.

26. A. Abdominal obesity defined by the waist circumference of >102 cm in men and > 88cm in women.

B. Triglyceride level of 150 mg/dL.

C. HDL – cholesterol <40 mg/dL in men and < 50 mg/dL in women.

D. Fasting blood glucose of 110 mg/dL.

E. Blood pressure of >130/85 mm hg.

27. MARIANNE ZELLER et al [43] studied 633 patients who got admitted in the hospital for acute myocardial infarction, the author reported the prevalence of metabolic syndrome was 46%.

28. Metabolic syndrome is common in patients who have both the DIABETES and SYSTEMIC HYPERTENSION .the prevalence was roughly varies between 35% and 80%. [44]

29. The mortality rate in patients with metabolic syndrome was 2 fold higher when compared to patients without the metabolic syndrome.

30. The heart failure was also more prevalent in patients with metabolic syndrome when compared to patients without the metabolic syndrome.

31. The heart failure has been attributed to the hyperglycemia in patients with metabolic syndrome and associated diastolic dysfunction due to diabetes mellitus.

32. CABADES, J.L DIEZ GIL et al [45]studied the relationship of gender differences with reference to the management and outcomes of acute coronary syndromes among 49 comprised of 38 men and 11 women patients with multi-vessel disease underwent percutaneous intervention. There was no gender difference in the angiographic lesions and left ventricular function wise. The median survival among men was 34.4 months when compared to 24.7 months in women. It was statistically significant p value =0.008. Female gender was found to have independent risk factor for predicting the mortality.

33. M BLONDAL, T AINLAL et al [46] assessed the relationship of reperfusion therapy and in – hospital mortality in patients with STEMI in Estoniain during 2001 versus 2007. About 2686 patients got hospitalized in the year 2001 when compared to 3483 patients in the year 2007. About 291 patients with STEMI were analyzed finally of which 129 patients during 2001 and 162 patients during 2007 were studied.

34. About 42.6 % of patients were treated with reperfusion during 2001 and 64.2% underwent reperfusion during 2007. Among reperfusion patients about 35% patients were treated with thrombolysis during 2001 when compared to 7.0% during 2007.

    56.8% of patients underwent primary PCI versus 7.8%, after adjustment for age and sex patients who underwent primary percutaneous intervention showed low in hospital mortality when compared to thrombolysis.

35. The incidence of arrhythmias in patients with STEMI treated with Percutaneous coronary intervention was studied by J KANOVSKY, P KALA et al [47] a sub-study of PROSPECT STEMI study.

36. About 586 patients with STEMI during the 3 years were taken into study. About 45.2% patients had anterior wall myocardial infarction, Inferior wall myocardial infarction without right ventricular involvement was seen in 28.8% and 11.7 % patients had inferior wall with right ventricular involvement.

37. Malignant arrhythmias were noted in about 11.5% patients with inferior wall MI with right ventricular involvement compared to 5.28 % in patients with anterior wall MI, which was statistically significant p value <0.05.

Atrio-ventricular block was noted in 15.49% of patients with inferior wall myocardial infarction with right ventricular involvement when compared to none in patients with anterior wall myocardial infarction which was statistically significant with p value <0.0001 .

38. Guidelines recommend CABG for patients with unprotected left main disease. TAPIA BALLESTEROS, HERNANDEZ LUIS et al [48] compared the in –hospital mortality of patients with unprotected left main disease using PCI versus CABG. Mean age was around 67%. About 50 patients were treated with CABG and 45 patients with worse clinical features at the time of admission were treated with percutaneous intervention. 23 % died during the hospital stay. The mortality during the 1 year post discharge follow up was 9% in PCI group compared to 0 % in CABG. Percutaneous coronary intervention is recommended for elderly patients with unprotected left main disease along with co- morbidities.

39. P Milicevic, M panic et al [49] studied the relationship between uric acid and mortality in patients with acute myocardial infarction they included about 912 patients with acute myocardial infarction. Patients were stratified into two sets, one with hyperuricemia and another without hyperuricemia.

40. Patients were followed up for a period of 12 months and mortality among two groups was assessed. Mortality was 36% in patients who had hyperuricemia when compared to 18.2% in patients without hyperuricemia.

41. P Vrsaloric, Getaldic B et al [50] assessed the prognosis of STEMI patients during the period January 2001 and December 2007. about 543 patients STEMI patients were assessed for 30 day mortality Utilizing Hematocrit, C- reactive protein and fibrinogen levels.

About 41% of patients of them died. By using univariate analysis hematocrit < 39% in men, hematocrit < 36% in women, CRP of 6.7 Mg/L, Fibrinogen > 3.9 g/L were significantly associated With adverse outcome following STEMI and after adjustment forage, gender, cardiovascular risk factors anaemia and CRP had association with outcome of MI.

42. J.M GARCIA –ACUNA, P AGUIAR SUOTOet al [51] did a study to assess the relationship between new onset atrial fibrillation and prognosis of myocardial infarction. About 1368 patients were followed up for a period of 14 months.

New onset atrial fibrillation was found in 8% of patients and patients with atrial fibrillation had mortality of 11.4% compared to 4.8% without atrial fibrillation. Ventricular tachycardia was found in 13.1% and heart failure was found in 48%. Using multivariate analysis atrial fibrillation of new onset was found to have significant association with adverse outcome following myocardial infarction.

43. R.L providencia, P.L Gomes et al [52] studied the relationship of admission blood glucose level and HbA1 c. about 212 patients were included for the study .within 24 hours of admission blood glucose and HbA1 C were assessed. Patients were followed up for a period of 2 years. 42% of patients had hyperglycemia above the level of 140 mg/dl. 29.2 % patients had elevated HbA1C. After univariate and multivariate analysis hyperglycemia at admission had strong association with outcome after MI short term and HbA1C predicted the long term outcome in patients with acute myocardial infarction.

44. Gheorghe, I T NANEA et al [53]studied the complications in patients with ACUTE MYOCARDIAL INFARCTION between patients with ST ELEVATION MI and NON ST ELEVATION MI.

About 238 patients werestudied. 60.5 % had ST elevation MI and 39.5% patients had Non ST elevation myocardial infarction. 18% of them were in Killip class II and 8.4% were in Killip class III which was similar between the two groups. 17.36% of STEMI had ventricular tachycardia and ventricular fibrillation,Compared to 2.12% of patients in NSTEMI group.

45. 26.3% patients with STEMI died when compared to NSTEMI. The death rate in NSTEMI was 6.38%. 17.36% patients with ST elevation myocardial infarction had atrio ventricular block 2$^{nd}$ and 3$^{rd}$ degree compared to 9.56 % patients with Non STelevation myocardial infarction.

46. The conclusion of the study was ST elevation myocardial infarction was significantly more associated with the incidence of KILLIP class IV heart failure, ventricular tachycardia,ventricular fibrillation when compared to Non ST elevation myocardial

infarction. It was more so in patients who had previous myocardial infarction and heart failure.

47. ASSANELLI, De Metrio et al [54] performed a study to assess the relationship of acute hyperglycemia with contrast induced nephropathy in patients with STEMI undergoing percutaneous intervention. Percutaneous coronary intervention in diabetic patients with acute myocardial infarction during a planned procedure had a well known association with elevation of renal parameters if there is Co -existing diabetic nephropathy. They took those patients with acute hyperglycemia with acute myocardial infarction and its relationship with contrast induced nephropathy

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48. About 780 patients were included in the study .the criteria for acute hyperglycemia is blood glucose >198 mg/dl. and contrast induced nephropathy was defined as elevation of renal parameters of 25% above the baseline within 72 hours of administration of contrast. 19% of patients had acute hyperglycemia. 14.5 % of patients had contrast induced nephropathy. The risk of developing contrast induced nephropathy was 2 times higher in patients with acute hyperglycemia. The mortality in patients with contrast induced nephropathy was 27% when compared to 0.9% in patients without that complication. The mortality in patients with acute

hyperglycemia and contrast induced nephropathy was 38% compared to 0.5 % in patients without that complication.

49. C.Fresco , M. de Biasio et al [55] did a study to find out whether left anterior descending artery is the target artery in smokers. They studied 83 patients aged< 45 years. Among the 83 patients 72% were males.

50. 64% of patients underwent percutaneous coronary intervention, 17% of patients were treated with thrombolysis. The patients were followed up for a period of 40 months. 53% were active smokers. Single vessel disease was noted in coronary angiography in about 68% of smokers and 65 % in non-smokers. In smokers left anterior descending artery was involved in about 55% of patients, circumflex was involved in about 19% of patients. Right coronary artery was involved in about 26% of patients.

51. Left anterior descending artery was involved in 42% of patients among non-smokers. There was no mortality during the follow up period of 40 months. The reason for the predilection of left anterior descending artery among smokers was not known when compared to former smokers.

52. M.J Garcia, Gonzalez et al [56] studied the impact of renal dysfunction on mortality in patients with acute myocardial infarction. About 150 patients who presented with renal failure along with myocardial infarction were included. GLOMERULAR FILTRATION RATE was estimated using COCKCROFT-GAULT formula. 125 patients had GFR > 60 ml/min and 25 patients had GFR < 60 ml/min.

53. The mortality rate was 24% in patients with GFR < 60 ml/min when compared to 5.6% in patients with GFR > 60 ml/min.

54. The renal dysfunction was strongly associated with in-hospital mortality in patients with renal dysfunction along with myocardial infarction at the time of admission.

55. I. Rosario, H. Dores et al [57] studied the relationship between myocardial infarction and diabetes mellitus. A retrospective study was done to find out the baseline characteristics among patients with diabetes mellitus and the type of myocardial infarction in those diabetics and the readmissions were assessed for a follow up period of 48 months.

56. Totally 587 patients were analyzed, 64% of them were males. 29.8% patients had unstable angina.35.8% of patients had Non ST elevation myocardial infarction, 34.4 % of patients had ST elevation MI. 26.7% of the diabetic patients were treated with insulin. In-hospital mortality was about 15.3% in diabetic patients when compared to 7.9% in non diabetics. During the follow up at 6 months diabetic patients had mortality 23.8% compared to 6.14% in non diabetics. At the end of 12 months the mortality rate among diabetics were 26.2% compared to 15.5% in non-diabetics, At the end of 24 moths mortality rates among diabetics was 28.6% compared to 16.3% in non diabetics.

57. The baseline characteristics and mortality was compared between STEMI and NSTEMI during the 5 year follow up period by C. Garcia –Garcia, I. Subirana et al [58] .about 2046 patients identified by RECATE II registry were analyzed, the proportion ofwomen, hypercholesterolemia, hypertension and diabetes were higher in patients among NSTEMI group patients. 34.6% of patients with NSTEMI underwent revascularization when compared to 21.7% in STEMI group. Surgical procedures were more commonly performed in NSTEMI group 14.4% compared to 7.4% in STEMI group.

58. In –hospital mortality was low in patients with NSTEMI 2.57%group when compared to STEMI group 5.94%. The mortality among NSTEMI group was 18.0% compared to 11.8% during the follow up of 5.6 years.

59. The influence of prior CABG on mortality in patients with acute myocardial infarction was studied by the M. Panic, P.Milicevic et al [59].

912 patients were studied and they were sub classified based on prior CABG and without CABG. About 55% patients had prior CABG.

60. In patients with prior CABG diabetes was more prevalent 49% when comparedto 26.7% in patients without PRIOR CABG .left ventricular ejection fraction was 27.6 $\pm$12.7 in patients with prior CABG. It was low when compared to patients without PRIOR CABG.

35.2$\pm$12.5. Mean survival was 36.6% in patients with prior CABG compared to 44.2% in patients without prior CABG. Though 1 year mortality was more in patients with prior CABG, prior CABG was not found to be an independent predictor of mortality.

61. P. Serpytis, K. Rucinskas et al [60] studied the relationship between risk factors for surgery and in-hospital mortality in patients with acute coronary syndrome.

62. About 246 patients were analyzed during the period of Jan 2004 and June 2009, patients were divided into two groups, those who have not survived and patients who were discharged. In-hospital rate mortality rate was 7.7%. Patients who did not survive had higher prevalence of peripheral vascular disease, renal failure, and chronicobstructive pulmonary disease. When compared to patients who got discharged.CABG IN PATIENTS WITH ACUTE CORONARY SYNDROME has to be decided on the basis of risk stratification and the presence of co-morbid conditions.

63. SamerThanavaro et al [61]studied the relationship of in-hospital mortality rate in patients with acute myocardial infarction on the basis of infarct location.

64. About 1105 patients with transmural infarction were analyzed.55.3% had anterior wall myocardial infarction. 44.4% of patients had inferior wall myocardial infarction. Analysis of complications was done based on the infarct location. The mortality was low in patients with inferior wall 9.1% when

compared to 15.6 % in patients with anterior wall myocardial infarction. The heart failure rates were low in patients with inferior wall myocardial infarction 39.4% compared to 47.6% in patients who had anterior wall infarction.

65. The cardiogenic shock rates were higher 12.6% in patients with anterior wall myocardial infarction when compared to 8.7% in patients with inferior wall myocardial infarction. The study concluded that infarct location was a strong independent predictor of adverse cardiovascular outcomes.

66. R.A .Providencia, J. Silva [62] assessed the mitral regurgitation role in patients with acute myocardial infarction. About 285 patients with acute myocardial infarction were taken for the study .about 65.4% were men.40.6% of patients had diabetes mellitus. Patients were followed up for a period of 24 months. Mitral regurgitation was present in 44.6% of the patients. The predictors of mitral regurgitation were female gender, diabetes mellitus, Atrial fibrillation, left ventricular ejection fraction of 55%, age > 70 years, Grace risk score of more than or equal to 140.

67. The presence of Atrial fibrillation, age more than 70 years, HbA1C Of more than or equal to 6.5% predicted the mortality after the follow up period of 24 months.

68. R.Faria, J. Mimoso[63] did a study to assess the 6 month mortality rate among patients with STEMI versus NSTEMI. About 1332 patients were included in the study.

18 % of patients with ST Elevation myocardial infarction and 13% of patients with NON ST Elevation myocardial infarction could not participate in the study.

69. 52 % of patients had ST Elevation myocardial infarction.48% of patients had NON ST Elevation myocardial infarction. They were followed up for a period of 6 months to assess the mortality. 17 % of the patients with ST Elevation myocardial infarction died compared to 14% in patients with NON ST Elevation myocardial infarction. The mortality rate was similar between the two groups at the end of 6 months.

70. Sana M. Al-Khatib et al [64] conducted a study to find out the relationship between ventricular arrhythmias in NON ST Elevation Myocardial infarction with 30 day and 6 months mortality.

71. The patients were pooled from four different data sets. About 552 number of patient had ventricular arrhythmias and 25, 864 patients did not have ventricular arrhythmias during the previous hospitalization. The independent predictors of ventricular tachyarrhythmia were prior

Systemic hypertension, chronic obstructive pulmonary disease, prior myocardial infarction, and ST –T changes in the electrocardiogram.

72. At the end of 30 days the Hazard ratio for ventricular fibrillation was 23.2 and for ventricular tachycardia were 7.6. At the end of 6 months the Hazard ratio for ventricular fibrillation was 14.8 and for ventricular tachycardia were 5.0. After the adjustment for cardiogenic shock or heart failure, both the ventricular tachycardia and ventricular fibrillation were associated with the 30 days and 6 months mortality in patients with non ST elevation myocardial infarction.

73. Marino Labinazet al [65] studied the outcome of myocardial infarction in patients with prior CABG versus without prior CABG.

The study population was selected from the PURSUIT trial. About 1134 patients had prior CABG and 8321 patients did not undergo CABG previously. The Hazard ratio for patients with prior CABG was 1.45 at the end of 30 days .the hazard ratio for patients with prior CABG at the end of 180 days were 1.32. There was a similar relationship in the end point between eptifibatide treated Group versus placebo.

# MATERIALS AND METHODS

# MATERIALS AND METHODS

## STUDY DESIGN:

1. Sample size - 100 patients.

2. Study population-the patients who got admitted to the RAJIV GANDHI GOVERNMENT GENERAL HOSPITAL for acute coronary syndrome.

3. Type of study – cross sectional study.

4. This study is a non-blinded and a Prospective study.

5. Period of study- From MAY 2012 TO NOVEMBER 2012.

6. The protocol of the study was approved by the Institutional Ethics Committee, madras medical college, Chennai 600003.

7. Written informed consent from all the 100 patients was obtained prior to the enrollment in the study.

## PATIENTS & METHODS

**Inclusion criteria:**

1. Study Population - patients admitted in Rajiv Gandhi Government General Hospital for acute coronary syndrome.
2. About 100 Patients aged between 18 years and 80 years, Were Included for study.
3. Both male and female gender was taken up for this study.

**Exclusion criteria**

1. Patients with chronic stable angina.
2. Patients with Rheumatic heart disease.
3. Patients with congenital heart disease.
4. Patients with aortic dissection/coarctation of aorta.
5. Patients who underwent bio-prosthetic and mechanical valve replacement surgeries.
6. Patients with acute illnesses associate with CAD.
7. Patients with diabetic ketoacidosisand non ketotic hyperosmolar coma.
8. Patients with known history of HIV 1/2, HEPATITIS B/C OR SYPHILIS in addition to ACS.
9. Patients with postpartum cardiomyopathy.

10. Patients below 18 and above 80 years.

11. Patients with disorientation and unable to take part in the study.

**Study Conduct**

**Number of patients: 100**

**Methodology**

**CASE DEFINITION**:

UA is defined as angina pectoris or equivalent ischemic discomfort with at least one of three features: (1) it occurs at rest (or with minimal exertion), usually lasting >10 minutes; (2) it is severe and of new onset (i.e., within the prior 4–6 weeks); and/or (3) it occurs with a crescendo pattern (i.e., distinctly more severe, prolonged, or frequent than previously).

The diagnosis of NSTEMI is established if a patient with the clinical features of UA develops evidence of myocardial necrosis, as reflected in elevated cardiac biomarkers.

**Criteria for ST SEGMENT ELEVATION**

ST segment elevation in at least two contiguous leads with the voltage criteria of 0.2 mV in men and 0.15 in women in the precordial leads $v_2$ and $v_3$ and 0.1 mV in other leads which is of new onset.

**CARDIAC BIOMARKERS:**

CK- MB normal value is 0.0-5.5 ng/ml.

ECHOCARDIOGRAPHY:

Ejection fraction 2D: 1. ≥ 55% = Normal LV systolic function.

2. 45 -54% = Mild systolic dysfunction.

3. 30- 44% = Moderate systolic dysfunction.

4. ≤ 29% = Severe LV dysfunction.

**METHODOLOGY**

1. Based on inclusion and exclusion criteria about 100 patients were included in the study.
2. Written informed consent from the eligible patients or their legal representatives was obtained after explaining the full details of the study.
3. The data of the patients were collected with the help of structured questionnaire, which was filled up after interviewing the patients or his/her family members.
4. Basic Laboratory investigations which include Complete Blood Count, Renal Function Tests, Random Blood Sugar, liver function tests, were obtained from all patients.
5. Cardiac bio-markers, fasting lipid profile, Electrocardiogram, Echocardiogram, during the time of admission were obtained.

6. Coronary angiogram, percutaneous coronary intervention and Coronary Artery Bypass Grafting were performed based on the clinical profile of the individual patients.

7. Baseline characteristics of the acute coronary syndrome were noted. Patients were observed for the major adverse cardiovascular outcomes such as complications during the admission for acute coronary syndrome and post discharge.

8. Those patients who got admitted for acute coronary syndrome are followed up regularly over a period of 6 months from May 2012 and November 2012 for adverse cardiovascular outcomes.

9. The major adverse cardiovascular outcomes looked for were re-infarction, cardiac failure, arrhythmias such as atrial fibrillation, ventricular tachycardia, ventricular fibrillation, sinus node dysfunction, atrioventricular conduction blocks, ischemic dilated cardiomyopathy, cardioembolic stroke, ventricular septal rupture, post infarction angina and death.

10. The patients were consulted regarding any re admission for cardiovascular events and other non-cardiac illnesses. The details of the intervention such as percutaneous coronary Intervention pacemaker insertion for conduction disturbances and Coronary Artery Bypass Grafting were noted.

11. Data was compiled and the Statistical analysis of the collected data was done.

## STATISTICAL ANALYSIS

Descriptive statistics were used for presenting the patient characteristics. All data would be subjected to FISHER'S EXACT TEST and UNPAIRED 't' test. Individual group comparisons would be made using parametric tests and non-parametric tests as appropriate. P value of <0.05 is taken as significant in this study. Statistical analysis was done with GRAPH PAD PRISM software.

# OBSERVATIONS AND ANALYSIS

# OBSERVATION AND ANALYSIS

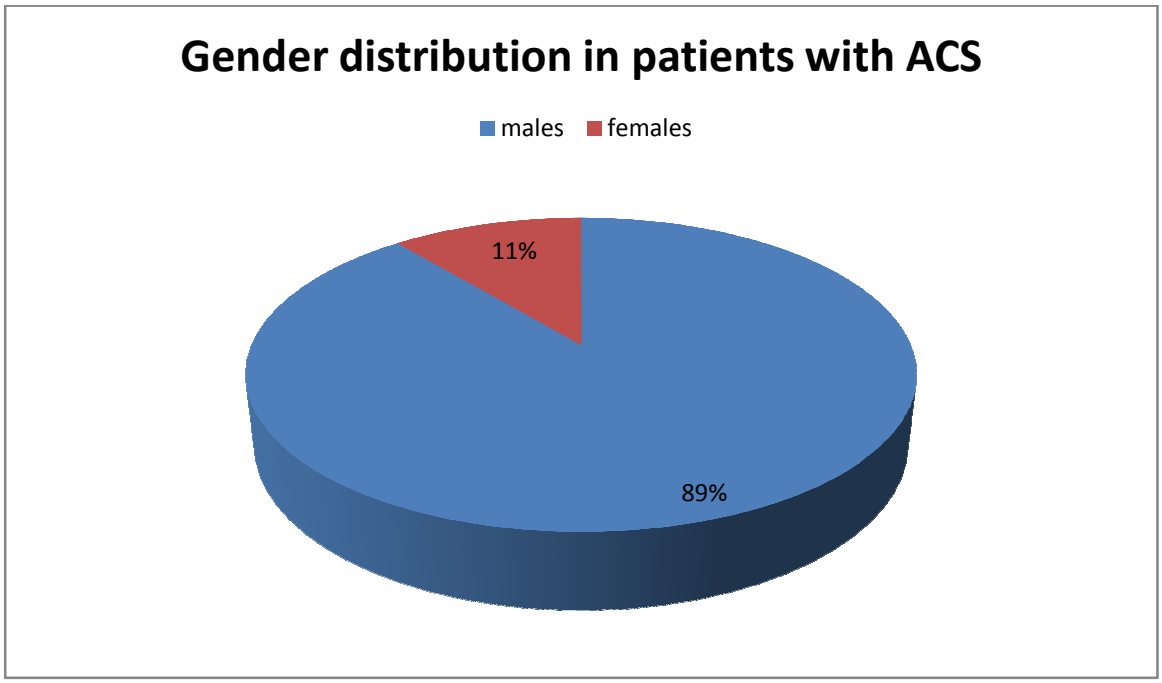
## TABLE 1

## GENDER DISTRIBUTION IN ACUTE CORONARY SYNDROMES PATIENTS

| MALES | FEMALES |
|---|---|
| 89% | 11% |

## CHART-1

## GENDER DISTRIBUTION IN PATIENTS WITH ACS



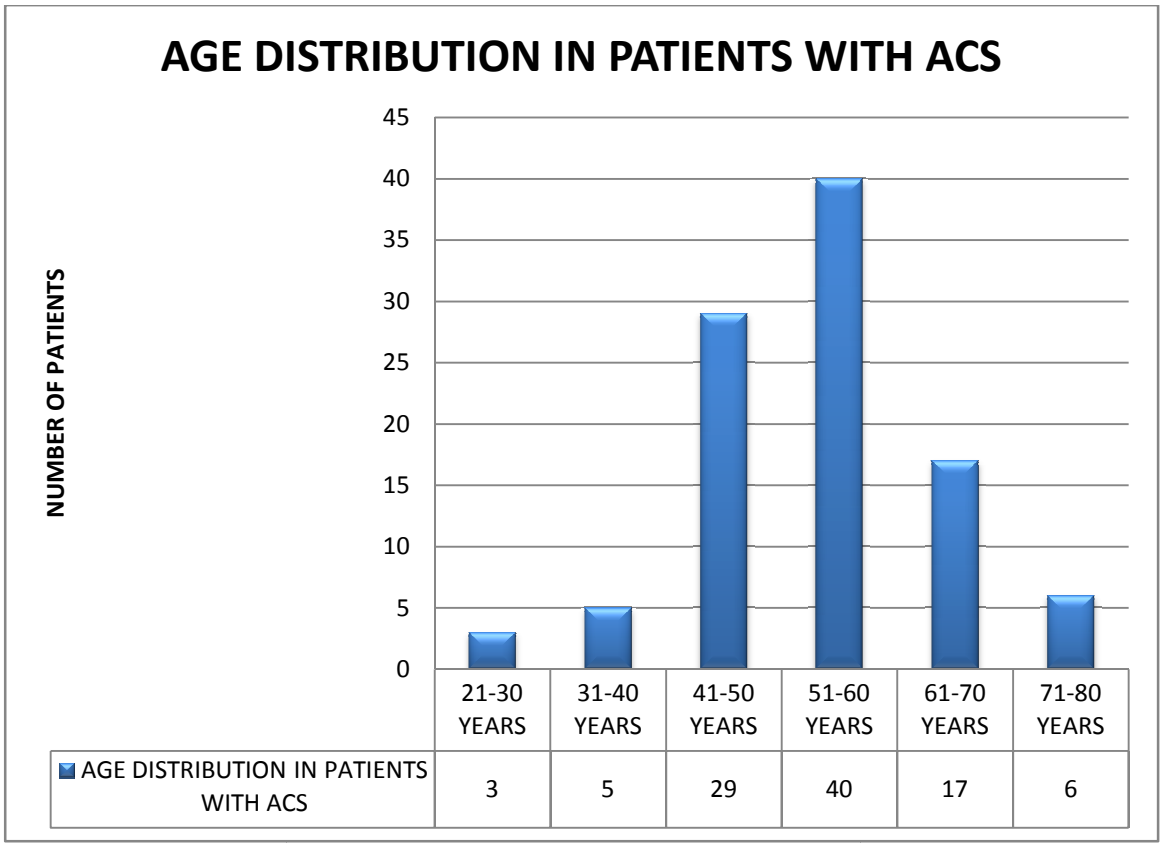
## TABLE-2

## AGE IN RELATION WITH ACUTE CORONARY SYNDROMES

| 21-30 YEARS | 31-40 YEARS | 41-50 YEARS | 51-60 YEARS | 61-70 YEARS | 71-80 YEARS |
|---|---|---|---|---|---|
| 3 | 5 | 29 | 40 | 17 | 6 |

## CHART-2

## AGE DISTRIBUTION IN PATIENTS WITH ACS



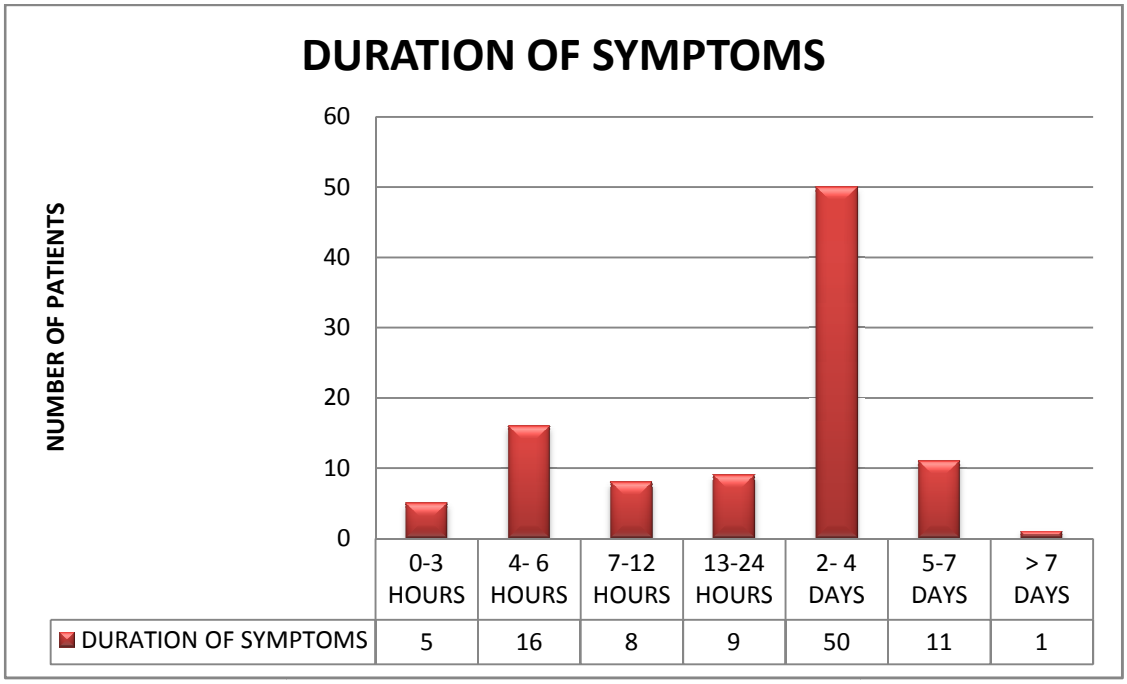
## TABLE-3

## DURATION OF SYMPTOMS IN PATIENTS PRESENTED WITH ACUTE CORONARY SYNDROMES

| S.NO | DURATION OF SYMPTOMS | NUMBER OF PEOPLE |
|---|---|---|
| 1. | 0-3 HOURS | 5 |
| 2. | 4- 6 HOURS | 16 |
| 3. | 7 – 12 HOURS | 8 |
| 4. | 13-24 HOURS | 9 |
| 5. | 2 – 4 DAYS | 50 |
| 6. | 5- 7 DAYS | 11 |
| 7. | >7 DAYS | 1 |

## CHART-3

## DURATION OF SYMPTOMS IN PATIENT WITH ACS



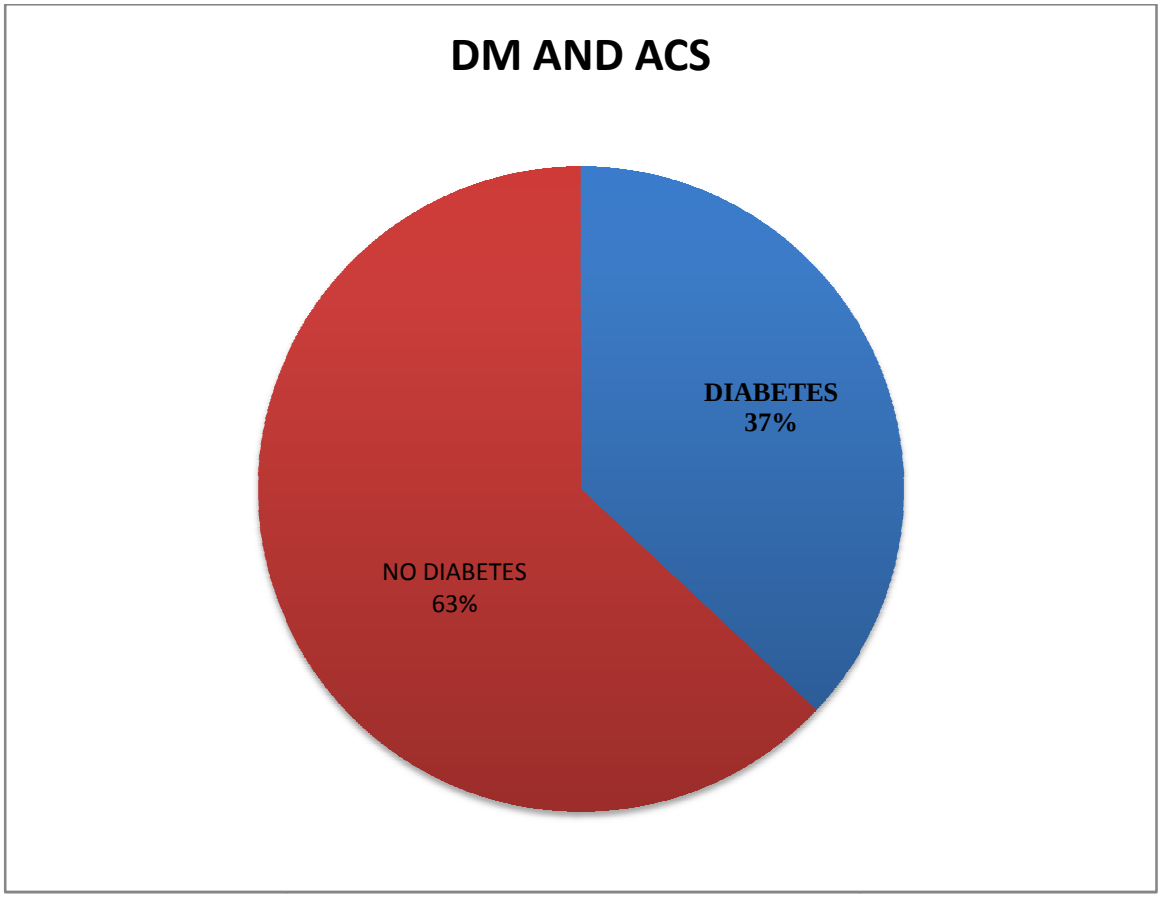
## TABLE-4

## DIABETES AND IT' S RELATIONSHIP TOACUTE CORONARY SYNDROME

| DIABETES | NO DIABETES |
|---|---|
| 37% | 63% |

## CHART-4

## DIABETES AND ACS



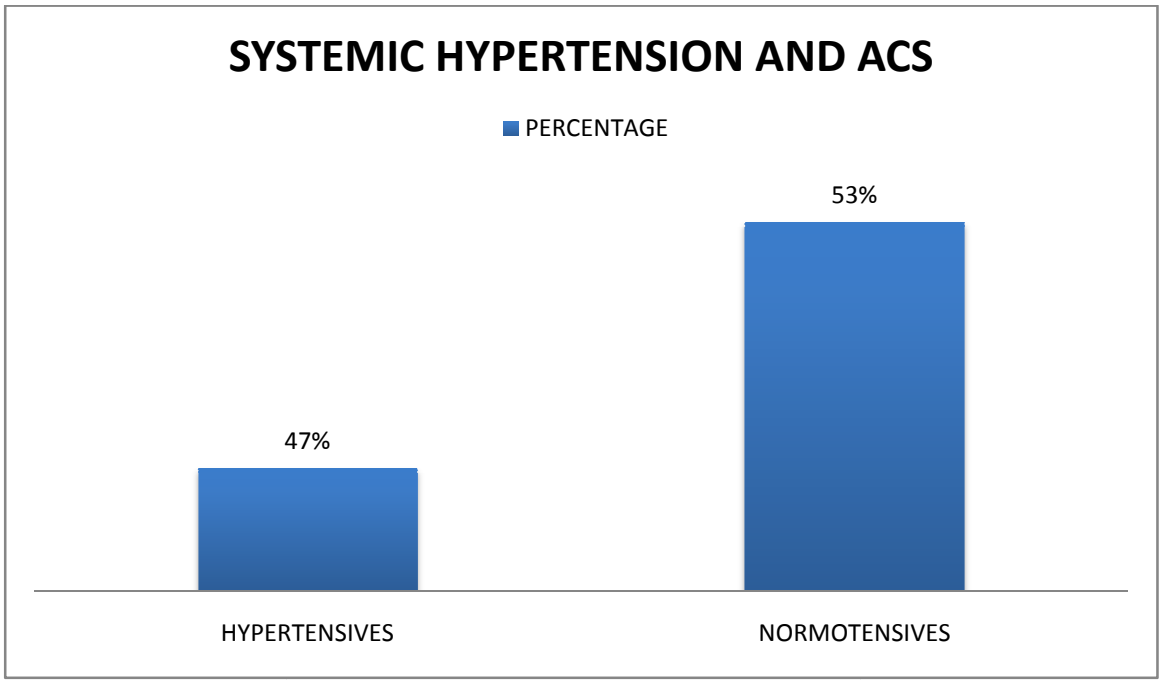
## TABLE-5

## SYSTEMIC HYPERTENSION AND ACUTE CORONARY SYNDROMES

| HYPERTENSIVES | NORMOTENSIVES |
|---|---|
| 47% | 53% |

## CHART-5

## SYSTEMIC HYPERTENSION AND ACS



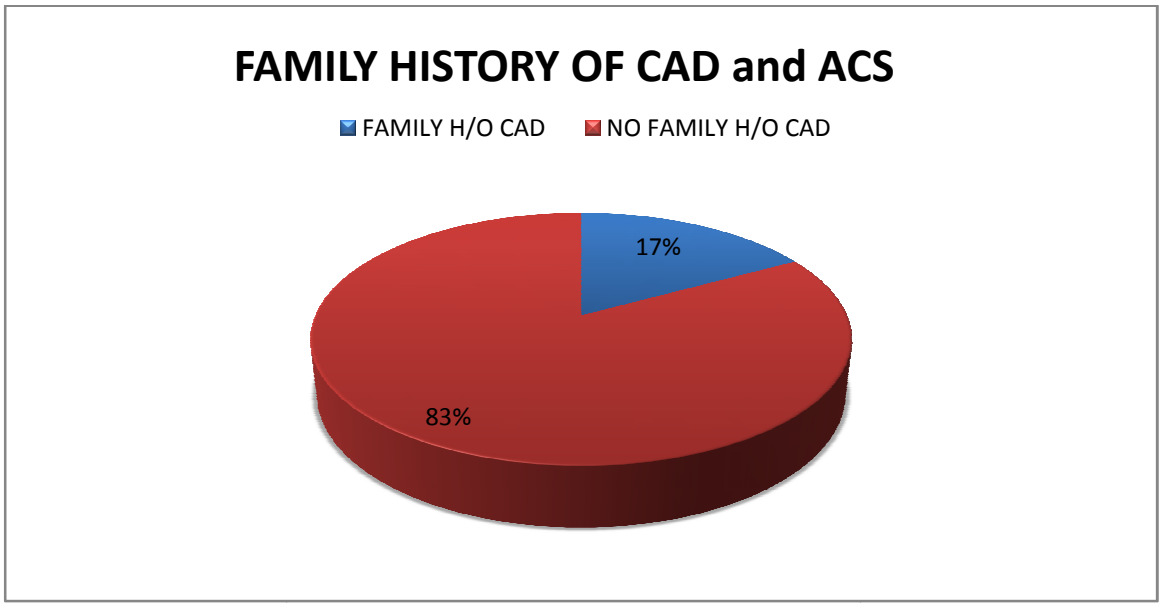
## TABLE 6

## FAMILY HISTORY OF CAD IN ACS PATIENTS

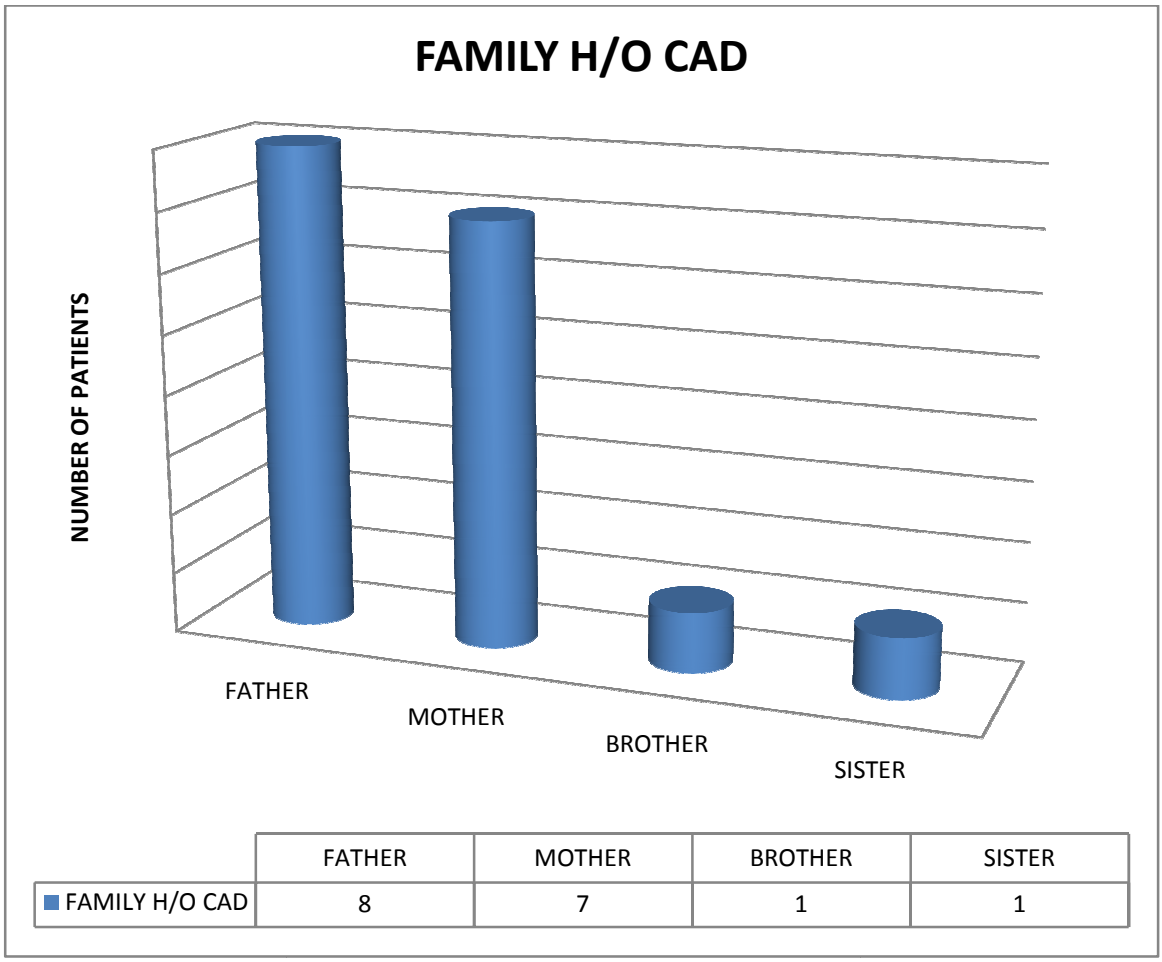
| TOTAL NO OF PATIENTS | FAMILY HISTORY OF CAD | | | | NO PRIOR FAMILY H/O CAD |
|---|---|---|---|---|---|
| 100 | 17 | | | | 83 |
| | FATHER | MOTHER | BROTHER | SISTER | |
| | | | | | |
| | 8 | 7 | 1 | 1 | |

## CHART-6A

## FAMILY HISTORY OF CAD AND ACS



## CHART-6B FAMILY HISTORY OF CAD AND ACS




| | FATHER | MOTHER | BROTHER | SISTER |
|---|---|---|---|---|
| FAMILY H/O CAD | 8 | 7 | 1 | 1 |

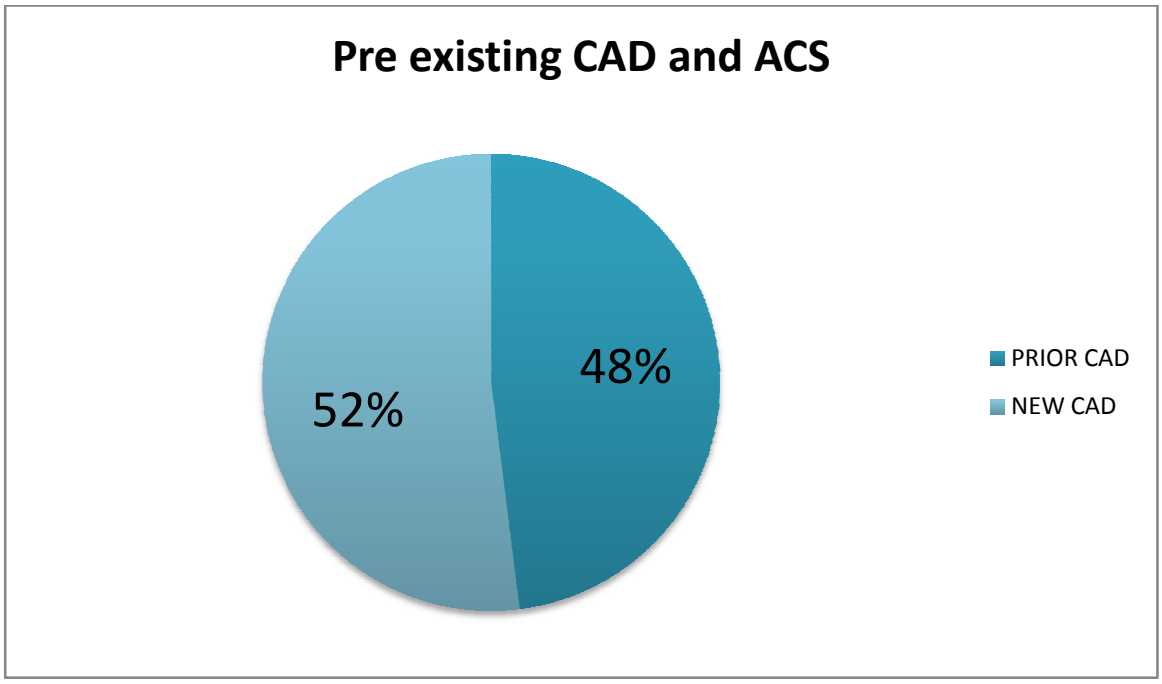
## TABLE-7

## PREEXISTING CAD IN PATIENTS WITH ACS

| | | |
|---|---|---|
| 1. | PRIOR CAD | 48% |
| 2. | NEW ONSET | 52% |

## CHART-7

## PRIOR HISTORY OF CAD



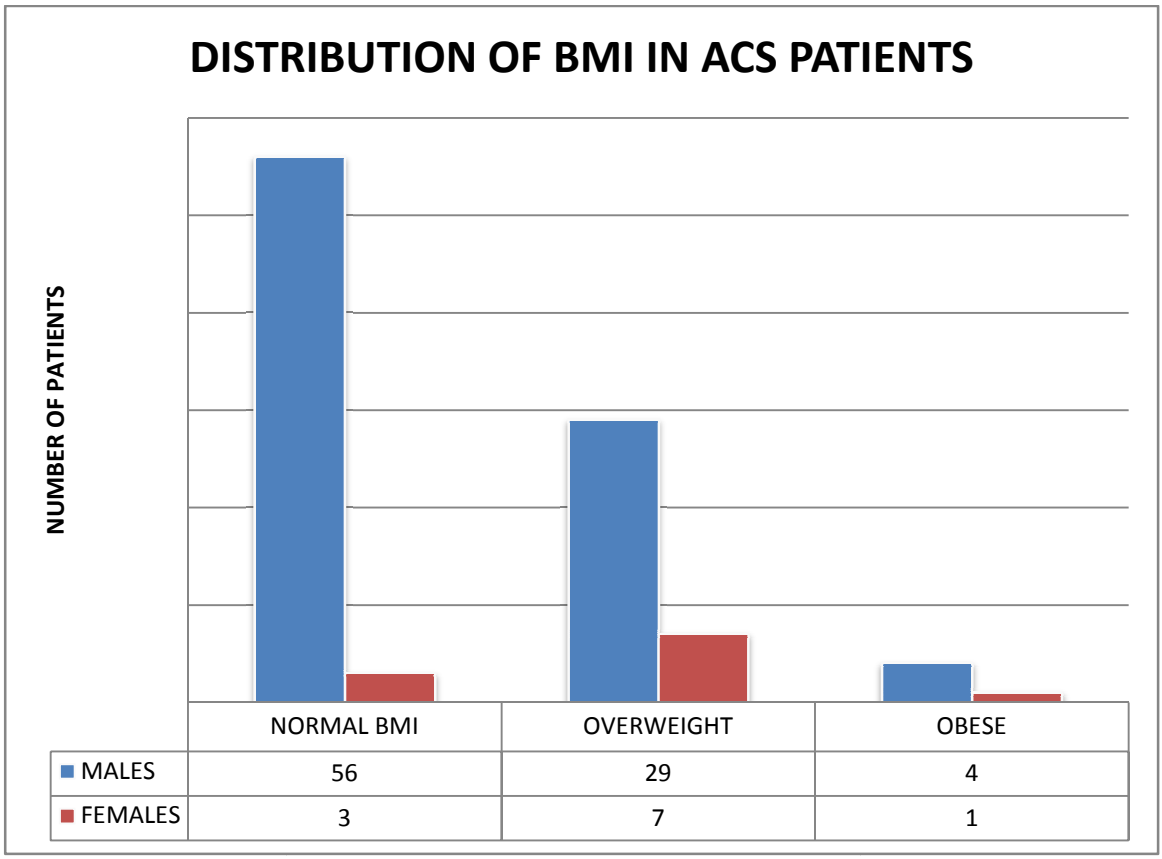
## TABLE-8

## DISTRIBUTION OF BMI AMONG PATIENTS WITH ACUTE CORONARY SYNDROMES

| NORMAL BMI | | OVERWEIGHT INDIVIDUALS | | OBESE PEOPLE | |
|---|---|---|---|---|---|
| 59 | | 36 | | 5 | |
| MALES | FEMALES | MALES | FEMALES | MALES | FEMALES |
| 56 | 3 | 29 | 7 | 4 | 1 |

## CHART-8

## DISTRIBUTION OF BMI IN ACS PATIENTS



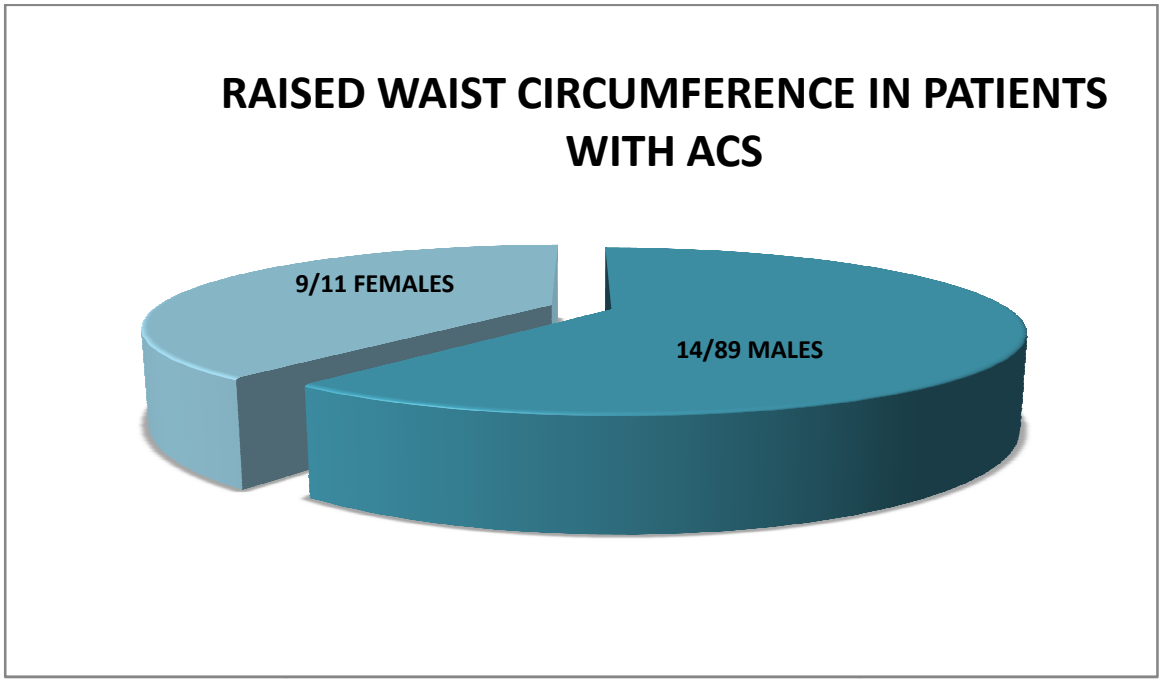
## TABLE-9

## WAIST CIRCUMFERENCE IN CMS

| MEN > 102 CMS | WOMEN > 88 CMS |
|---|---|
| 14 OUT OF 89 | 9 OUT OF 11 |

## CHART 9

## WAIST CIRCUMFERENCE AND IT'S RELATION WITH ACS



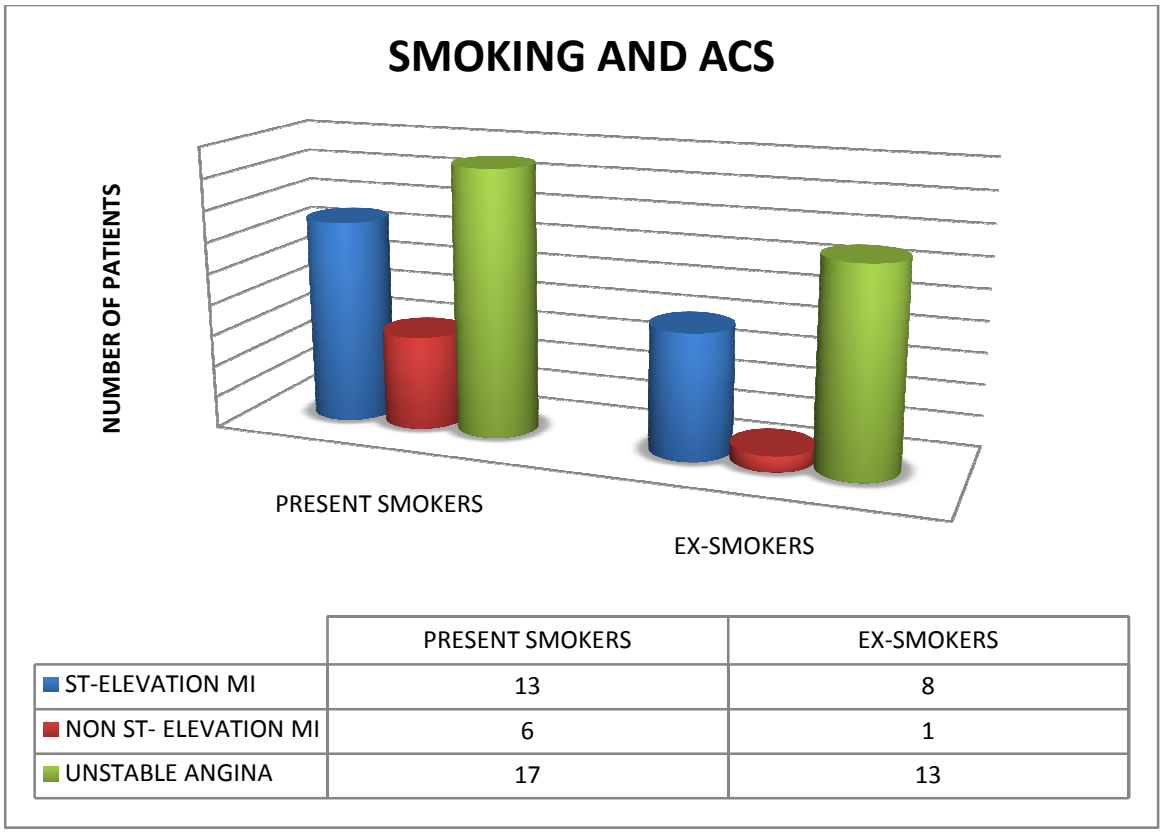
## TABLE 10

## SMOKING AND ACS

| S.NO | SMOKING | ST ELEVATION MI | NON ST ELEVATION MI | UNSTABLE ANGINA |
|---|---|---|---|---|
| 1. | PRESENT SMOKERS | 13 | 6 | 17 |
| 2. | EX-SMOKERS | 8 | 1 | 13 |

## CHART 10

## SMOKING AND ACS



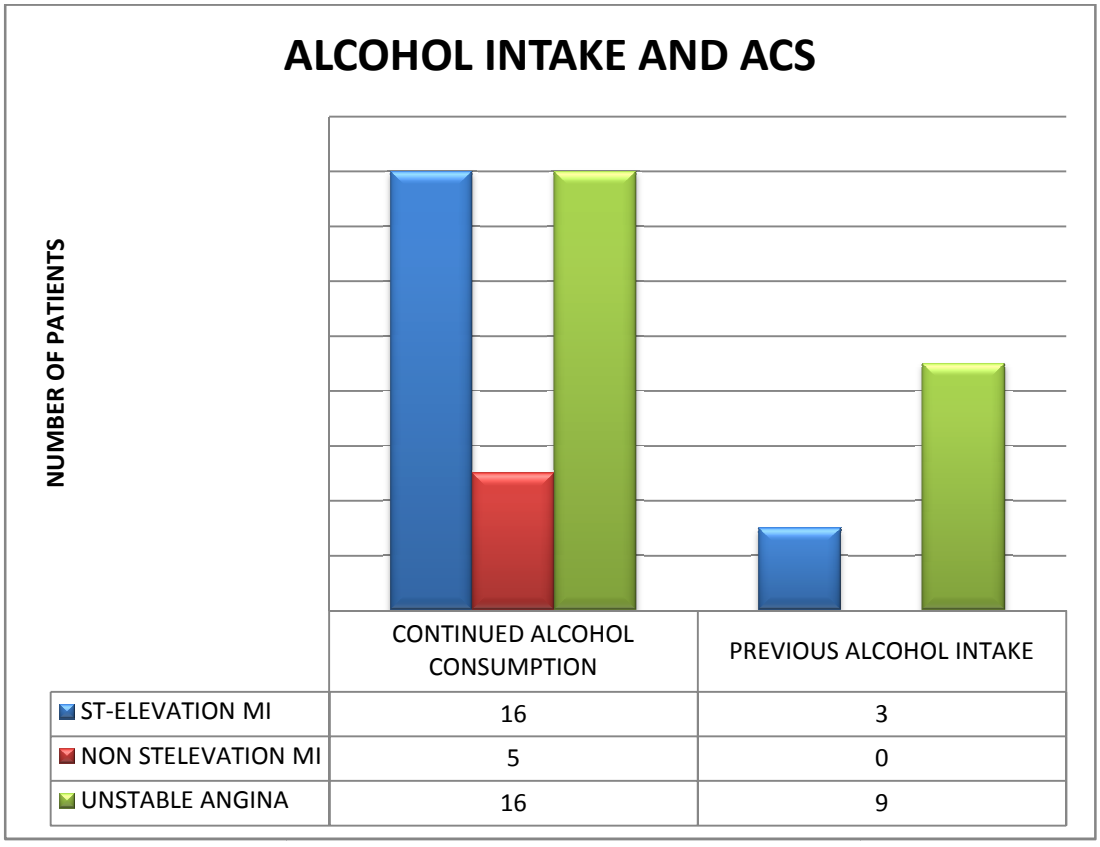
## TABLE-11

## RELATIONSHIP OF ALCOHOLISM IN PATIENTS WITH ACUTE CORONARY SYNDROMES

| S.NO | ALCOHOLISM | ST-ELEVATION MI | NON ST-ELEVATION MI | UNSTABLE ANGINA |
|---|---|---|---|---|
| 1. | CONTINUED ALCOHOL CONSUMPTION | 16 | 5 | 16 |
| 2. | PREVIOUS ALCOHOL INTAKE | 3 | 0 | 9 |

## CHART 11

## RELATIONSHIP OF ALCOHOL IN PATIENTS WITH ACS



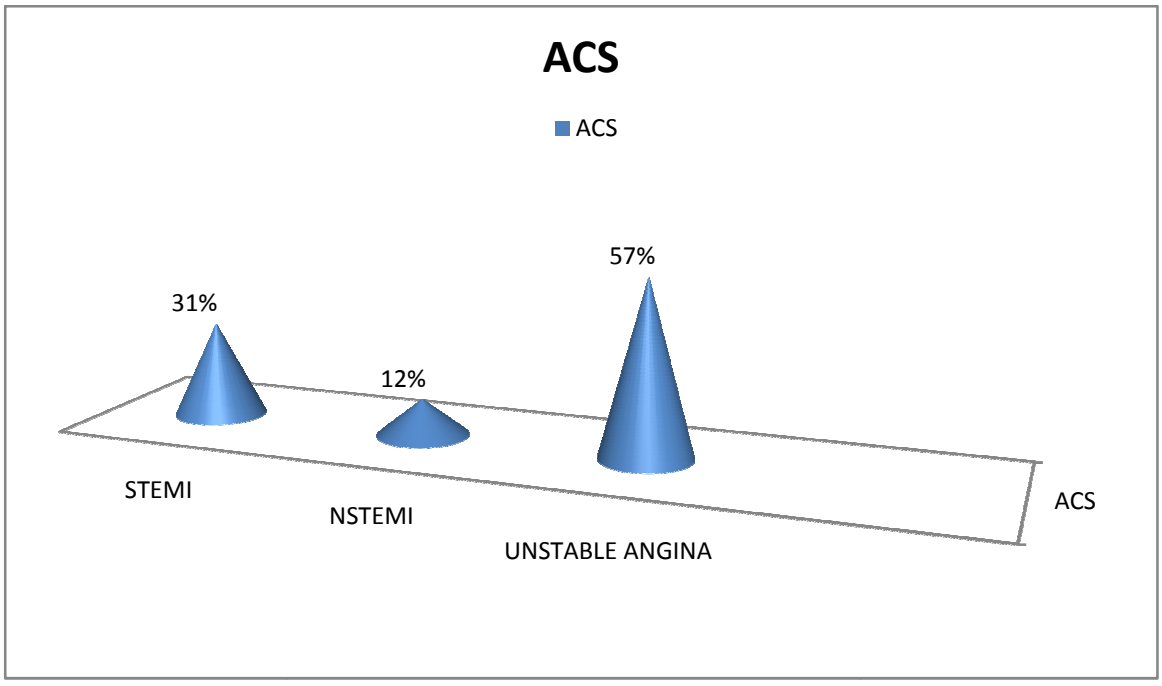
## TABLE-12

## ACUTE CORONARY SYNDROMES

| ST- ELEVATIONMI | NON ST-ELEVATION MI | UNSTABLE ANGINA |
|---|---|---|
| 31 | 12 | 57 |

## CHART-12

## ACUTE CORONARY SYNDROME



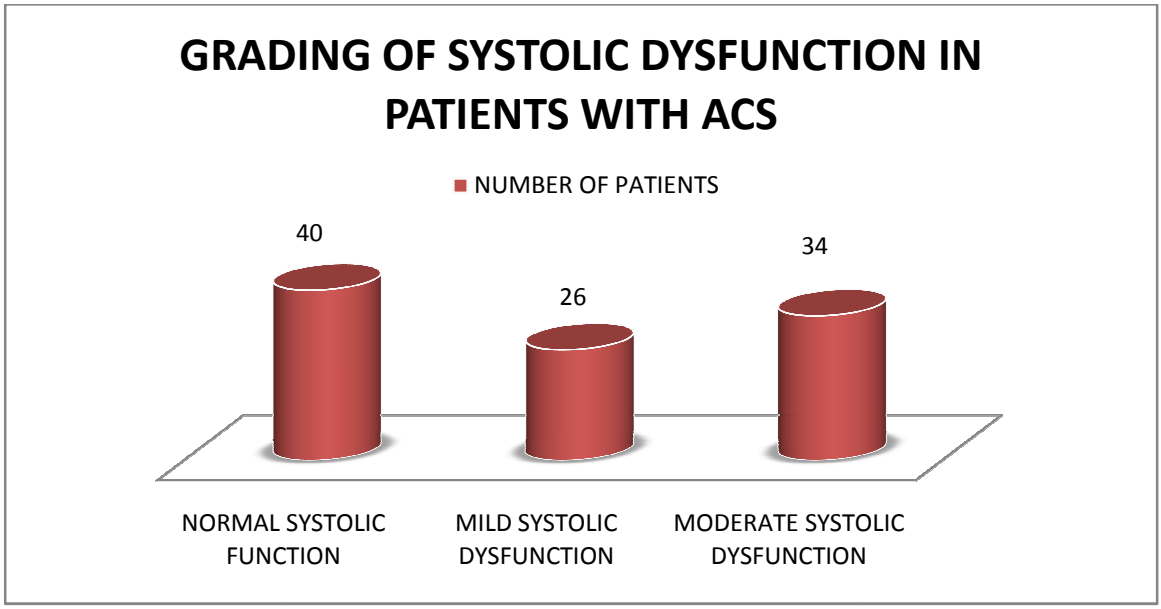
## TABLE-13

## SYSTOLIC FUNCTION IN PATIENTS WITH ACS

| NORMAL SYSTOLIC FUCTION | DECREASED EJECTION FRACTION | |
|---|---|---|
| | MILD DYSFUNCTION | MODERATE DYSFUNCTION |
| 40 | 26 | 34 |

## CHART-13

## SYSTOLIC FUNCTION IN ACS



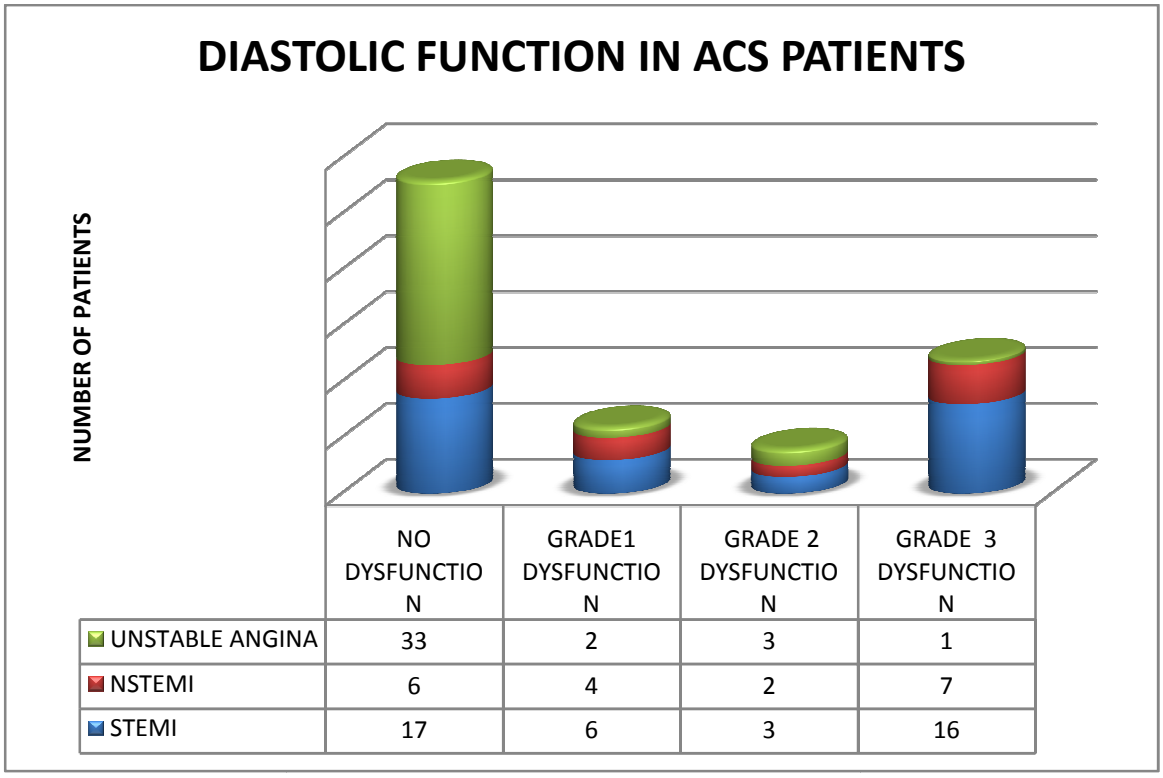
## TABLE-14

## DIASTOLIC FUNCTION IN PATIENTS WITH ACUTE CORONARY SYNDROMES

| S.NO | DIASTOLIC FUNCTION | ST-ELEVATION MI | NON ST-ELEVATION MI | UNSTABLE ANGINA |
|---|---|---|---|---|
| 1. | **NO DYSFUNCTION** | 17 | 6 | 33 |
| 2. | **GRADE 1 DYSFUNCTION** | 6 | 4 | 2 |
| 3. | **GRADE 2 DYSFUNCTION** | 3 | 2 | 3 |
| 4. | **GRADE 3 DYSFUNCTION** | 16 | 7 | 1 |

## CHART-14

## DIASTOLIC FUNCTION IN ACS



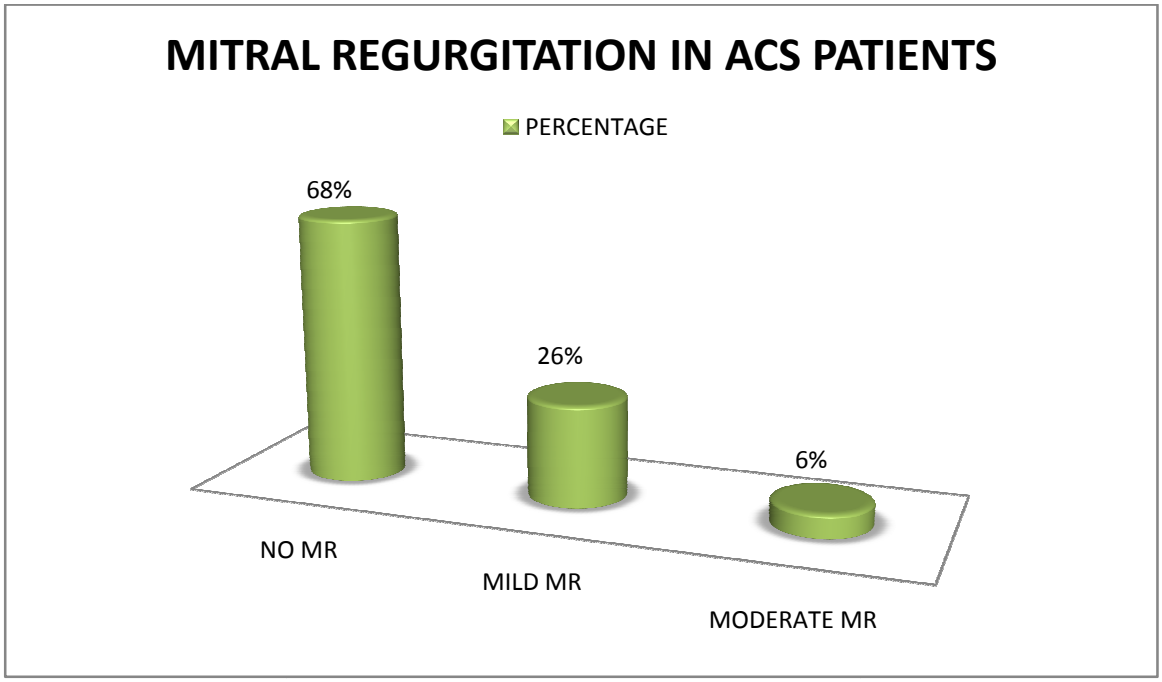
## TABLE-15

## MITRAL REGURGITATION IN PATIENTS WITH ACUTE CORONARY SYNDROMES

| NO MR | MILD MR | MODERATE MR |
|---|---|---|
| 68 | **26** | **6** |

## CHART-15

## MITRAL REGURGITATION AND ACS



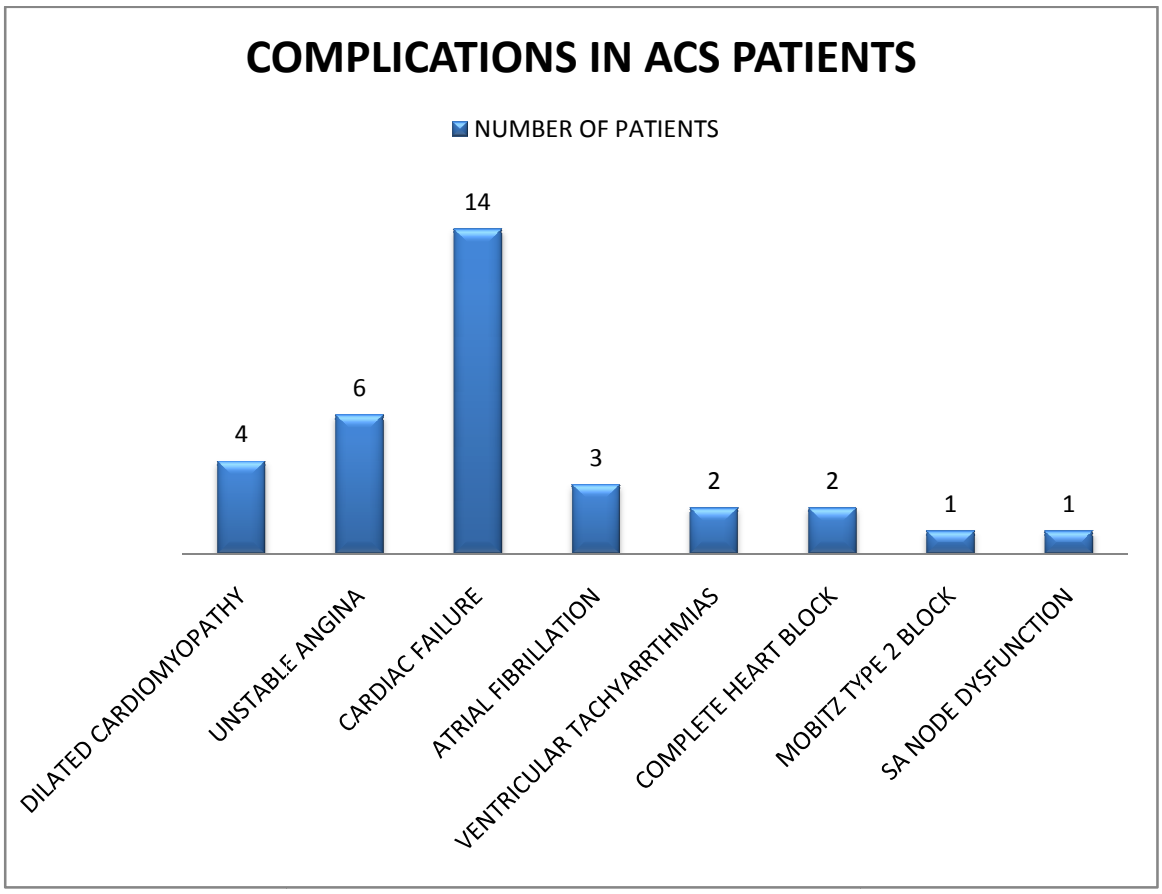
## TABLE-16

## COMPLICATIONS IN PATIENTS WITH ACS DURING THE FOLLOW UP

| SERIAL NUMBER | COMPLICATIONS | TOTAL NUMBER OF PATIENTS |
|---|---|---|
| 1 | DILATED CARDIOMYOPATHY | 4 |
| 2 | UNSTABLE ANGINA | 6 |
| 3 | CARDIAC FAILURE | 14 |
| 4 | ATRIAL FIBRILLATION | 3 |
| 5 | VENTRICULAR TACHYARRYTHMIAS | 2 |
| 6 | COMPLETE HEART BLOCK | 2 |
| 7 | MOBITZ TYPE 2 BLOCK | 1 |
| 8 | SA NODE DYSFUNCTION | 1 |

## CHART 16

## COMPLICATIONS IN ACS



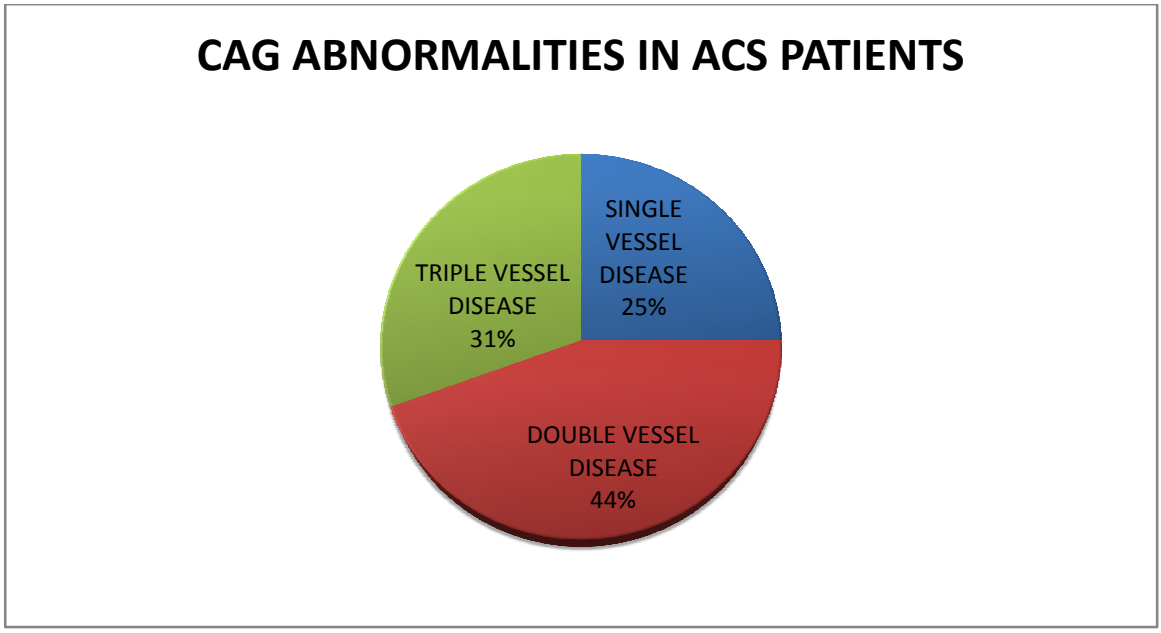
## TABLE-17

## NUMBER OF PATIENTS WITH CAG ABNORMALITIES

| SINGLE VESSEL DISEASE | DOUBLE VESSEL DISEASE | TRIPLE VESSEL DISEASE |
|---|---|---|
| 9 | 16 | 11 |

## CHART-17

## CAG ABNORMALITIES IN PATIENTS WITH ACS



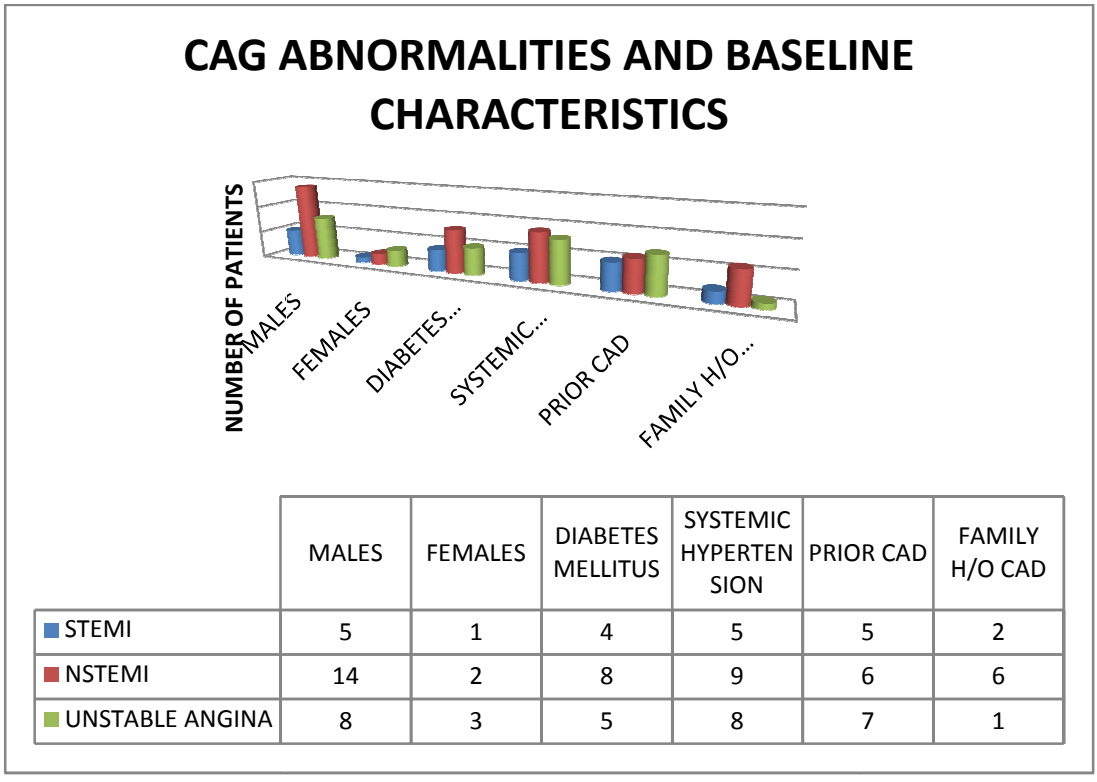
## TABLE-18

## BASELINE CHARACTERISTICS OF PATIENTS WITH CORONARY ANGIOGRAPHIC ABNORMALITIES

| S.NO | DEMOGRAPHIC DATA | SINGLE VESSEL DISEASE | DOUBLE VESSEL DISEASE | TRIPLE VESSEL DISEASE |
|---|---|---|---|---|
| 1 | MALES | 5 | 14 | 8 |
| 2 | FEMALES | 1 | 2 | 3 |
| 3 | DIABETES MELLITUS | 4 | 8 | 5 |
| 4 | SYSTEMIC HYPERTENSION | 5 | 9 | 8 |
| 5 | PRIOR CAD | 5 | 6 | 7 |
| 6 | FAMILY HISTORY OF CAD | 2 | 6 | 1 |

## CHART-18

## CAG ABNORMALITIES AND BASELINE CHARACTERISTICS




| | MALES | FEMALES | DIABETES MELLITUS | SYSTEMIC HYPERTENSION | PRIOR CAD | FAMILY H/O CAD |
|---|---|---|---|---|---|---|
| STEMI | 5 | 1 | 4 | 5 | 5 | 2 |
| NSTEMI | 14 | 2 | 8 | 9 | 6 | 6 |
| UNSTABLE ANGINA | 8 | 3 | 5 | 8 | 7 | 1 |

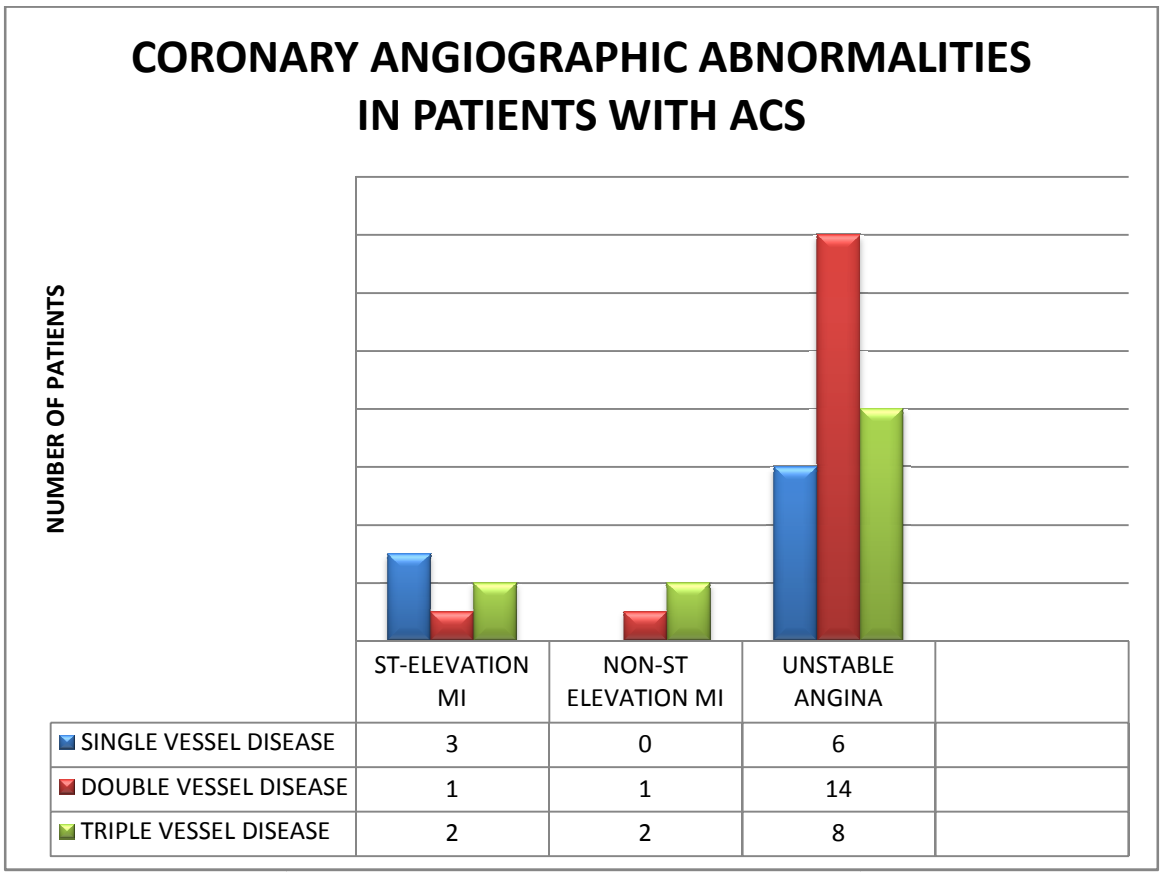
## TABLE-19

## CORONARY ANGIOGRAM ABNORMALITIES IN PATIENTS WITH ACUTE CORONARY SYNDROMES

| S.NO | ACUTE CORONARY SYNDROME | SINGLE VESSEL DISEASE | DOUBLE VESSEL DISEASE | TRIPLE VESSEL DISEASE |
|---|---|---|---|---|
| 1. | **ST ELEVATION MI** | 3 | 1 | 2 |
| 2. | **NON ST ELEVATION MI** | 0 | 1 | 2 |
| 3. | **UNSTABLE ANGINA** | 6 | 14 | 8 |

## CHART-19

## CAG ABNORMALITIES IN PATIENTS WITH ACS



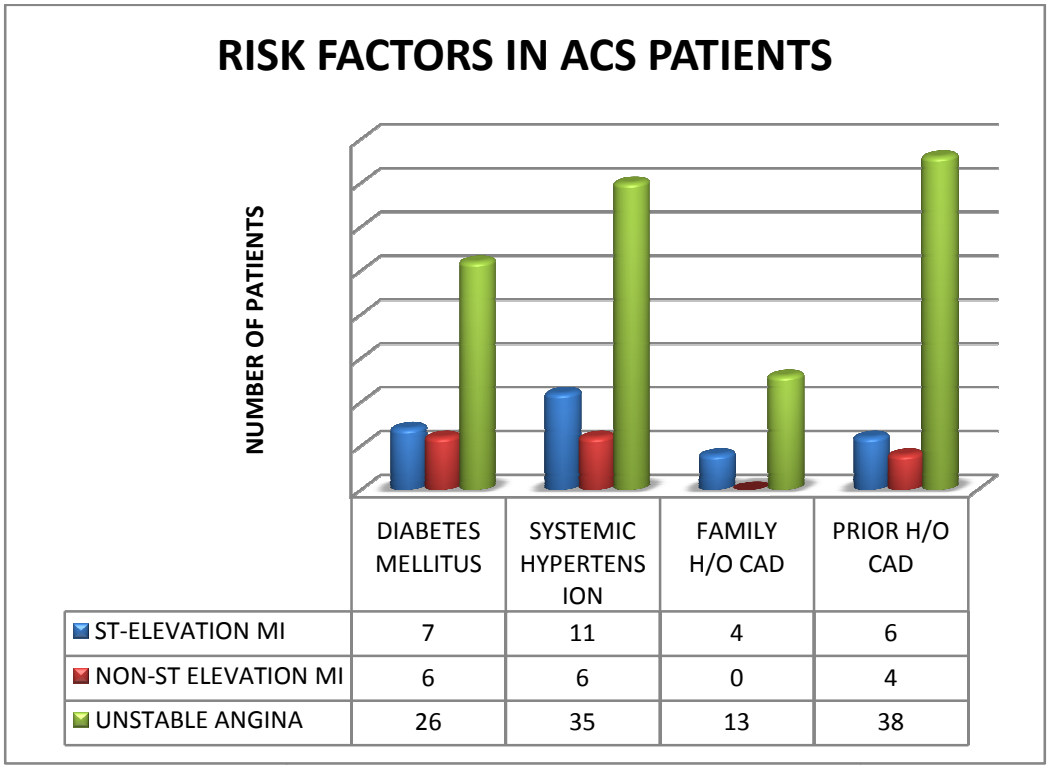
## TABLE-20

## RELATIONSHIP OF RISK FACTORS OF ACUTE CORONARY SYNDROMES

| S.NO | ACUTE CORONARY SYNDROMES | DIABETES MELLITUS | SYSTEMIC HYPERTENSION | FAMILY HISTORY OF CAD | PRIOR CAD |
|---|---|---|---|---|---|
| 1. | **ST ELEVATION MI** | 7 | 11 | 4 | 6 |
| 2. | **NON ST ELEVATION MI** | 6 | 6 | 0 | 4 |
| 3. | **UNSTABLE ANGINA** | 26 | 35 | 13 | 38 |

## CHART-20

## RISK FACTORS IN ACS PATIENTS



# DISCUSSION

# DISCUSSION

1. 89% of patients were males, 11% were females. Males had increased incidence of acute coronary syndromes.

2. Patients in the age group of 51-60 years had increased incidence of acute coronary syndrome. Patients with young myocardial infarction as defined by age <45 yrs constituted about 19%.Rabih R Azar et al [66] reported that the age limit for defining young patients as between 40 – 45 years. Diabetes had a strong association in this study which is statistically significant p <0.008. Smoking did not have significant association in this study. p=0.06. Probably further stratification of smoking is needed to prove the association.

3. Complications were less in patients with young MI compared to patients aged > 45 year which was statistically significant. P <0.005.No deaths were noted in patients with young myocardial infarction.

**TABLE 21**

**COMPARISONS BETWEEN PATIENTS WITH MI**

**AGED LESS THAN 45 YRS AND MORE THAN 45 YRS**

| CHARACTERISTICS | MI IN PATIENTS AGED< 45 YEARS (n= 19) | MI IN PATIENTS AGED > 45 YEARS (n= 81) | P VALUE |
|---|---|---|---|
| **AGE** | 38.31± 6.52 | 57.33± 8.02 | 0.0001*** |
| **DIABETES MELLITUS** | 2 | 35 | 0.008** |
| **HYPERTENSION** | 6 | 41 | 0.2 ns |
| **SMOKING** | 15 | 43 | 0.06 ns |
| **FAMILY H/O CAD** | 3 | 14 | 1.0 ns |
| **COMPLICATIONS** | 0 | 32 | 0.005** |
| **DEATH** | 0 | 5 | 0.5 ns |

*** - extremely significant, ** - significant,

ns-not significant

4. In comparison of MI in patients with hypertension and normotension, patients with hypertension had significant association with PRIOR CAD. MI patients with hypertension had higher ejection fraction when compared to patients with normotension which was statistically significant p value 0.001.

**TABLE- 22**

**COMPARISONS OF BASELINE CHARACTERISTICS IN HYPERTENSIVES AND NORMOTENSIVES AMONG MI PATIENTS**

| CHARACTERISTICS | HYPERTENSIVES (n=47) | NORMO-TENSIVES (n=53) | PVALUE |
|---|---|---|---|
| **DM** | 18 | 19 | 0.8ns |
| **PRIOR CAD** | 28 | 20 | 0.04 * |
| **EJECTION FRACTION** | 48.85± 10.02 | 42.55±8.94 | 0.001** |
| **CARDIAC COMPLICATIONS** | 14 | 19 | 0.5 ns |

*- quite significant, ** - significant, ns-not significant

5. In MI patients with diabetes and no diabetes, diabetes had significant association hypertension which was statistically significant p =0.0001.

6. DIABETIC MI population was strongly associated with prior CAD which was statistically significant p =0.03.Diabetes patients had no statistically significant association with systolic dysfunction, diastolic dysfunction and complications in this study.

**TABLE 23**

**COMPARISONS BETWEEN MI IN PATIENTS WITH**

**DIABETES AND NO DIABETES**

| CHARACTERISTICS | DIABETES MELLITUS (n=37) | NO DIABETES MELLITUS (n=63) | PVALUE |
|---|---|---|---|
| **HYPERTENSION** | 7 | 40 | 0.0001 *** |
| **PRIOR CAD** | 23 | 25 | 0.03* |
| **EJECTION FRACTION** | 49.20±12.04 | 50.42±10.56 | 0.6 ns |
| **DIASTOLIC DYSFUNCTION** | 19 | 25 | 0.2 ns |
| **COMPLICATION** | 15 | 18 | 0.2 ns |

*- quite significant, *** - extremely significant,
ns -not significant

7. The relationship between AWMI and smoking was studied. There was no correlation between smoking and anterior wall MI in this study.

8. C.Fresco, M. de Biasio et al [55] reported association between smoking and anterior wall MI (LAD involvement).The present study had no association. Probably further stratification and larger sample size is needed to prove the association.

**TABLE 24**

**COMPARISON OF ANTERIOR WALL MI AND SMOKING IN PATIENTS WITH MI**

| CHARACTERISTICS | AWMI n=18 | NON AWMI n=82 | P VALUE |
|---|---|---|---|
| SMOKERS | 10 | 48 | 1.00 ns |
| NON SMOKERS | 8 | 34 | |

ns- not significant

9. Family H/O CAD was present in 17 % of the patients. Prior CAD was present in 48% of the patients.

10. UNSTABLE ANGINA constituted about 57%, STEMI constituted about 31 % of patients with ACS. NSTEMI constituted about 12% of Patients with ACS.

11. All patients had type I myocardial infarction based on clinical classification of MI [6].

12. About 60 % of patients had systolic dysfunction and 44% of the patients had diastolic dysfunction.

13. 32% of the patients with ACS had mitral regurgitation.

14. 33% of the patients with ACS complications, the details are measured in TABLE 14. The complications include cardiac failure, dilated cardiomyopathy, unstable angina happened in about18% of patients. tachyarrythmias which include atrial fibrillation and ventricular tachycardia occurred in about 15% of patients.

15. Bradyarrythmias which include SA node dysfunction (for which patient underwent permanent pacemaker insertion) and atrio ventricular block happened in about 12% of patients.

16. Patients with inferior wall MI had conduction disturbances when Compared to anterior wall MI which was statistically significant p=0.0003.

17. J KANOVSKY, P KALA et al [47] that patients with inferior wall MI was associated with conduction disturbances and more so the association is more with inferior wall and right ventricular involvement.

**TABLE 25**

**CONDUCTION DISTURBANCES IN PATIENTS WITH**

**INFERIOR WALL MI AND AWMI**

| CHARACTERISTICS | CONDUCTION DISTURBANCES (n=4) | NO CONDUCTION DISTURBANCES (n=96) | P VALUE |
|---|---|---|---|
| **IWMI** | 4 | 11 | 0.0003 *** |
| **NO IWMI** | 0 | 85 | |

*** - extremely significant

**TABLE 27**

**CARDIAC BIOMARKERS CK MB IN PATIENTS WITH STEMI**

**AND NSTEMI**

| ST ELEVATION MI (n= 31) | NON ST ELEVATION MI (n = 12) |
|---|---|
| MEDIAN 424.03IU/ml. | MEDIAN 536IU/ml. |

MEDIAN ck MB was higher among patients who had NSTEMI when compared to STEMI.

18. Coronary angiographic abnormalities were present in about 37% of patients with ACS. Single vessel involvement was involved in 9 patients, double vessel disease was present in 16 patients and triple vessel disease was noted in 12 patients.

19. About 9 patients underwent percutaneous coronary intervention and 4 patients underwent CABG.

20. Complications were nil in patients who underwent percutaneous intervention compared to no PCI which was statistically significant p=0.02. Death rate was not significant between PCI and no PCI .due to the small sample of the intervened group. A larger sample size is necessary to compare the association between the mortality and PCI.

**TABLE 28**

**COMPARISONS BETWEEN PCI AND NO PCI GROUP**

| CHARACTERISTICS | PCI (n=9) | NO PCI (n=91) | P VALUE |
|---|---|---|---|
| **COMPLICATIONS** | 0 | 33 | 0.02* |
| **DEATH** | 0 | 5 | 1.00 ns |

*- quite significant, ns- not significant

21. There was no significant association between complications and mortality between CABG and NO CABG group, which is probably due to the small sample size.

**TABLE 29**

**COMPARISONS BETWEEN CABG AND NO CABG GROUP**

| CHARACTERISTICS | CABG (n=4) | NO CABG (n=96) | P VALUE |
|---|---|---|---|
| **COMPLICATIONS** | 1 | 32 | 1.00 ns |
| **DEATH** | 1 | 4 | 0.18 ns |

ns- not significant

22. In patients with intervention which include PCI and CABG group prior CAD is associated with the prognosis and no difference were noted in other parameters such as systolic function, complications, mortality due to small sample size.

**TABLE 30**

**COMPARISONS BETWEEN INTERVENTION AND NO INTERVENTION GROUP**

| CHARACTERISTICS | INTERVENTION (n =13) | NO INTERVENTION (n=87) | P VALUE |
|---|---|---|---|
| **DM** | 4 | 33 | 0.7 ns |
| **HYPERTENSION** | 6 | 41 | 1.00 ns |
| **PRIOR CAD** | 10 | 38 | 0.03 * |
| **EJECTION FRACTION** | 51.35±9.425 | 49.97±10.75 | 0.6 ns |
| **COMPLICATIONS** | 4 | 29 | 1.00 ns |
| **DEATH** | 1 | 4 | 0.5 ns |

*-quite significant, ns – not significant

23. About 5% patients with ACS died during the follow up period of 6 Months. The complications rate among patients in mortality group versus no mortality was statistically significant p value 0.0032.

24. There was an association between mortality and PRIOR CABG which was statistically quite significant between died and survived patients. p=0.05

**TABLE 31**

**COMPARISONS BETWEEN MORTALITY AND SURVIVAL AMONG PATIENTS WITH ACS**

| CHARACTERISTICS | DEATH (n=5) | NO DEATH (n=95) | P VALUE |
|---|---|---|---|
| **DM** | 2 | 35 | 1.00 ns |
| **HYPERTENSION** | 2 | 45 | 1.00 ns |
| **PRIOR CAD** | 4 | 44 | 0.1 ns |
| **BMI** | 24.20±3.92 | 23.87±4.90 | 0.8 ns |
| **EJECTION FRACTION** | 49.62±11.29 | 49.97±10.75 | 0.9 ns |
| **COMPLICATION** | 5 | 28 | 0.0032 *** |
| **PRIOR CABG** | 1 | 0 | 0.05* |

*- quite significant,***-extremely significant, ns-not significant

# CONCLUSIONS

# CONCLUSION

1. Males had increased incidence of acute coronary syndrome, about 89% when compared to females 11%.

2. About 8% of patients aged less than 45 years had myocardial infarction.

3. DM was significantly associated with MI among patients aged less than 45 years.

4. Patients with young MI had good prognosis.

5. Diabetes mellitus and Systemic hypertension was strongly associated with prior CAD.

6. Mean ejection fraction was higher in patients with hypertension compared to normotension.

7. There was no correlation between smoking and anterior wall myocardial infarction in this study.

8. History of PRIOR CAD was present in about 48% of the patients.

9. Unstable angina was more prevalent among patients with ACS. 57 % of patients had UNSTABLE ANGINA, 31% had STEMI and 12 % had NSTEMI.

10. 60 % of patients with ACS had systolic dysfunction.

11. 44 % of patients with ACS had diastolic dysfunction.

12. Inferior wall MI was strongly associated with conduction disturbances when compared to patients with AWMI.

13. Coronary angiographic abnormalities were present in 37% of ACS patients, 9 had Single vessel disease, 16 had double vessel disease, 12 had triple vessel disease.

14. 9% of the patients underwent PCI, 4% underwent CABG and 1 patient with prior CABG died.

15. Complications following ACS occurred in about 33% of the patients.

16. Mortality rate was 5% in patients with ACS.

17. No complications occurred in patients who underwent PCI.

18. No significant association observed among complications and death in patients between CABG and NO CABG.

This study is done to find out the characteristics of patients with ACS admitted in our hospital. Many patients are getting admitted again for recurrent chest pain and other complications to our hospital. This study highlighted the baseline characteristics and 6 months prognosis follow up among ACS patients in our hospital. With this information improvement can be made in managing patients with ACS and thereby complications can be reduced and reducing the economic burden of the patients as well as for country.

## STUDY LIMITATIONS

1. Sample size was smaller to compare the baseline characteristics among ACS patients. If sample size was larger more association can be made out.

2. Further stratification among diabetic patients regarding the oral hypoglycemic agents and insulin is necessary, for deriving detailed prognosis following ACS among those patients, those details were lacking in the present study.

3. Stratification of smoking is needed to prove the association between AWMI and smoking.

4. Prognosis of MI patients based on cardiac biomarkers, cardiac Troponin need to be done that is lacking in the present study, due to unavailability of troponin assays in our hospital.

5. More intervention needs to be done among patients with ACS that was lacking in the present study due to financial constraints.

6. Prognosis between PRIOR CABG and NO PRIOR CABG patients can be made, more number of patients with CABG have to be included in the study.

## FURTHER STUDIES

1. Prognosis can be made based on uric acid levels in patients with ACS.

2. Prognosis based on recent cardiac biomarkers like BNP, NT pro BNP can be made.

3. A study on Prognosis among patients with prior CABG and without CABG can be undertaken, since many patients present with MI following as well as many years after CABG.

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66. Rabih R Azar, MD, MSc Gary V Heller, MD, PhDCmbi / bjmu / edu / cnuptodate

# ANNEXURES

## ABBREVIATIONS

| | | |
|---|---|---|
| CAD | : | Coronary Artery Disease |
| ACS | : | Acute Coronary Syndrome |
| MI | : | Myocardial Infarction |
| STEMI | : | ST Elevation Myocardial Infarction |
| NSTEMI | : | Non ST Elevation Myocardial infarction |
| TMT | : | Tread Mill Test |
| WC | : | Waist Circumference |
| BMI | : | Body Mass Index |
| ECG | : | Electrocardiography |
| ECHO | : | Echocardiogram |
| ESC | : | European Society of Cardiology |
| LBBB | : | Left Bundle Branch Block |
| LV | : | Left Ventricle |
| MR | : | Mitral Regurgitation |
| CAG | : | Coronary Angiogram |
| DD | : | Diastolic Dysfunction |
| CABG | : | Coronary Artery Bypass Graft |

| | | |
|---|---|---|
| PCI | : | Percutaneous Coronary Intervention |
| CRP | : | C - reactive protein |
| CrCl | : | Creatinine Clearance |
| GFR | : | Glomerular Filtration Rate |
| CK – MB | : | Creatinine kinase MB |
| TROP-T | : | Troponin T |
| URL | : | Upper Reference Limit of Normal. |

**PROFORMA**

Name: Age: Sex:

Education:

Address:

Unit/Ward:

ID number:

INFORMANT : Self / Other RELATION

PRESENT HISTORY

Day of onset of the symptoms

Time of onset of the symptoms

Treatment obtained prior to admission

PAST & PERSONAL HISTORY

| | | |
|---|---|---|
| Diabetes Mellitus | Yes / No | Duration |
| Hypertension | Yes / No | Duration |
| Angina | Yes / No | Duration |
| Myocardial Infarction | Yes / No | Duration |
| Heart failure | Yes / No | Duration |
| Peripheral Vascular disease | Yes / No | Duration |
| Asthma or COPD | Yes / No | Duration |
| Dyslipidemia | Yes / No | Duration |
| Alcoholism | Yes / No | Duration |
| Smoking | Yes / No | Duration |

Medications

FAMILY HISTORY

| | | |
|---|---|---|
| Hypertension Yes/No | Duration | |
| Diabetes | Yes/No | Duration |
| Coronary artery disease | Yes/No | Duration |

PREGNANCY/PUERPERIUM AT PRESENT Yes /No

VITALS

Pulse rate : /min

Blood Pressure :

/ mm Hg Limb : RUL / LUL Posture: /sitting / Supine

ANTHROPOMETRY

Height : m

Weight : kg

BMI : kg / $m^2$

Waist Circumference :

CVS :

Respiratory system :

Abdomen examination :

CNS examination :

**INVESTIGATIONS:**

**COMPLETE HEMOGRAM**

Hemoglobin : g/dL

Total Count : cells/cu.mm

Differential count :

RBC Count : cells/cu.mm

Platelets : lakhs/cu. mm

**BLOOD BIOCHEMISTRY**

| | | |
|---|---|---|
| Random Blood Sugar | : | mg/dL |
| Blood Urea | : | mg/dL |
| Serum Creatinine | : | mg/dl |
| Serum sodium | : | meq/l |
| Serum potassium | : | meq/l. |
| CK MB | : | IU/ml. |
| Troponin | : | ng/ml. |
| Fasting lipid profile | : | mg/dl |

**LIVER FUNCTION TESTS**

| | | | |
|---|---|---|---|
| 1. | Total bilirubin | : | mg/dl. |
| 2. | AST | : | IU/L. |
| 3. | ALT | : | IU/L. |
| 4. | Total proteins | : | grams/dL. |
| 5. | Albumin | : | grams/dl. |

**URINE ANALYSIS**

1. ALBUMIN
2. SUGAR
3. DEPOSITS

ECG

CHEST XRAY

ECHOCARDIOGRAM

ANGIOGRAM

TMT

CABG

## PATIENT CONSENT FORM

- **STUDY DETAIL** : "TO ASSESS THE BASELINE CHARECTERISTICS AND THE ADVERSE CARDIOVASCULAR OUTCOMES IN PATIENTS WITH ACUTE CORONARY SYNDROMES WHO GOT ADMITTED IN RAJIV GANDHI GOVERNMENT GENERAL HOSPITAL FOR THE MANAGEMENT OF ACUTE CORONARY SYNDROMES"

Study Centre : Rajiv Gandhi Government General Hospital, Chennai.

Name of the patient :

Age / Sex :

Identification Number :

Patient/Legal representative may check ( √ ) these boxes

- I confirm that I have understood the purpose of procedure for the above study. I have the opportunity to ask question and all my questions and doubts have been answered to my complete satisfaction. ☐
- I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving reason, without my legal rights being affected. ☐
- I understand that sponsor of the clinical study, others working on the sponsor's behalf, the ethical committee and the regulatory authorities will not need my permission to look at my health records, both in respect of current study and any further research that may be conducted in relation to it, even if I withdraw from the study I agree to this access. However, I understand that my identity will not be revealed in any information released to third parties or published, unless as required under the law. I agree not to restrict the use of any data or results that arise from this study. ☐

- I agree to take part in the above study and to comply with the instructions given during the study and faithfully cooperate with the study team and to immediately inform the study staff if I suffer from any deterioration in my health or well being or any unexpected or unusual symptoms. ☐
- I hereby consent to participate in this study. ☐
- I hereby give permission to undergo complete clinical examination and diagnostic tests including hematological, biochemical, radiological tests. ☐

Signature/thumb impression of the Patient/Legal Representative:

Name and Address:

Place: Date:

Signature of the impartial witness:

Name and Address:

Place: Date:

Signature of investigator :

Name :

Place: Date

**INSTITUTIONAL ETHICS COMMITTEE**
**MADRAS MEDICAL COLLEGE, CHENNAI -3**
Telephone No : 044 25305301
Fax : 044 25363970

## CERTIFICATE OF APPROVAL

To
Dr.S. Ramarajan
PG in MD Internal Medicine
Madras Medical College, Chennai -3

Dear Dr.S. Ramarajan

The Institutional Ethics committee of Madras Medical College, reviewed and discussed your application for approval of the proposal entitled "To assess the baseline charecteristics and the adverse cardiovascular outcomes in patients with acute coronary syndromes who got admitted to Rajiv Gandhi Govt. General Hospital for the management of acute coronary syndromes No.09042012.

The following members of Ethics Committee were present in the meeting held on 19.04.2012 conducted at Madras Medical College, Chennai -3.

| | |
|---|---|
| 1. Dr. S.K. Rajan. M.D.,FRCP.,DSc | -- Chairperson |
| 2. Prof. Pregna B. Dolia MD<br>Director , Institute of Biochemistry, MMC, Ch-3 | -- Member Secretary |
| 3. Prof. B. Kalaiselvi MD<br>Prof. of Pharmacology ,MMC, Ch-3 | -- Member |
| 4. Prof. C. Rajendiran, MD<br>Director , Inst. of Internal Medicine, MMC, Ch-3 | -- Member |
| 5. Prof. Md. Ali. MD.DM<br>Prof & HOD, Dept. of MGE, MMC, Ch-3 | -- Member |
| 6. Prof.P.Karkuzhali MD<br>Director i/c, Prof., Inst. of Pathology, MMC, Ch-3 | -- Member |
| 7. Prof. S. Deivanayagam MS<br>Prof of Surgery, MMC, Ch-3 | -- Member |
| 8. Prof. A. Radhakrishnan MD<br>Prof of Internal Medicine, MMC, Ch-3 | -- Member |
| 9. Thiru. S. Govindsamy. BABL | -- Lawyer |
| 10. Tmt. Arnold Soulina MA MSW | -- Social Scientist |

We approve the proposal to be conducted in its presented form.

Sd/ Chairman & Other Members

The Institutional Ethics Committee expects to be informed about the progress of the study, and SAE occurring in the course of the study, any changes in the protocol and patients information / informed consent and asks to be provided a copy of the final report.

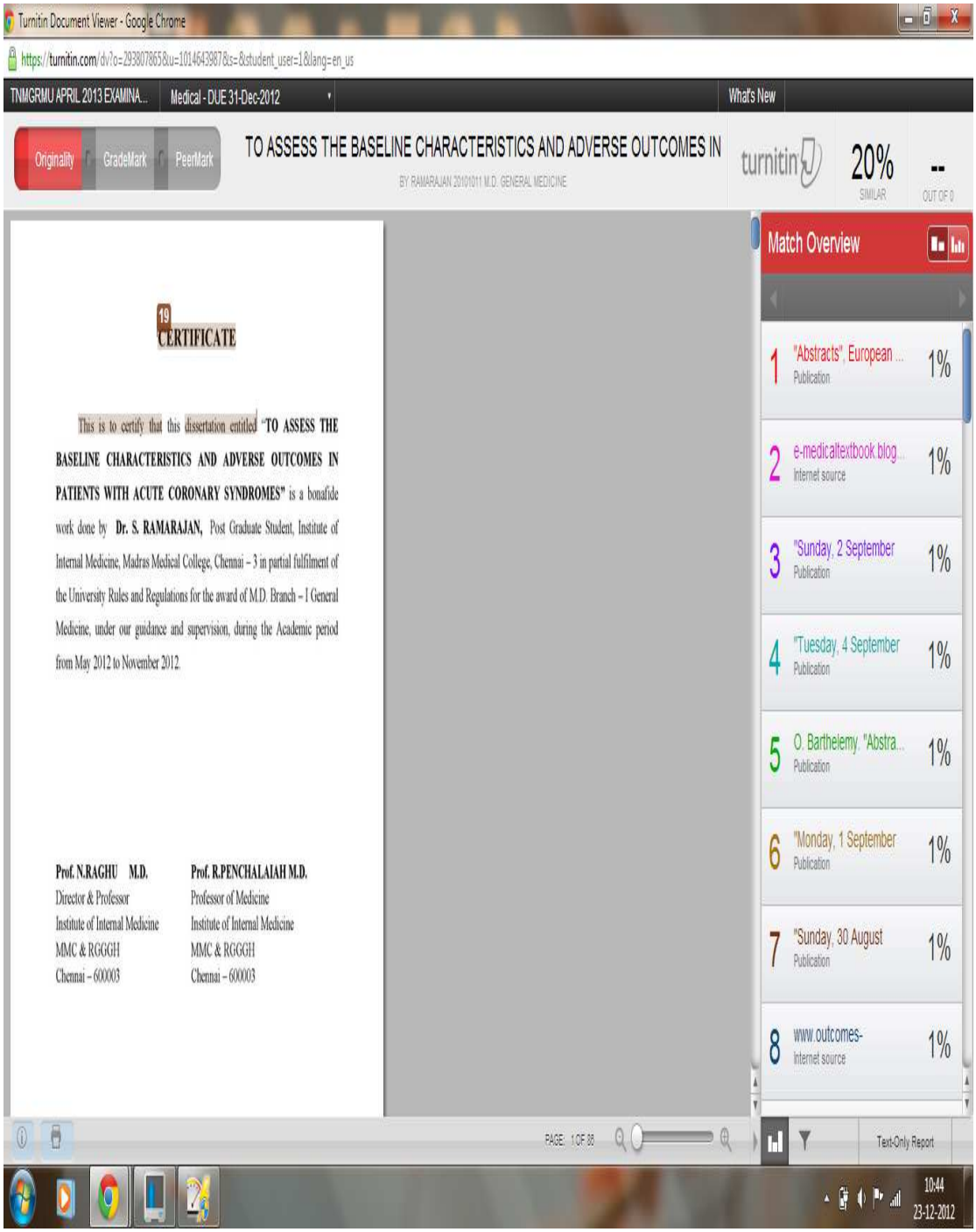
Member Secretary, Ethics Committee

| NAME | AGE | SEX | OCCUPATION | EDUCATION | DURATION OF SYMPTOMS | DM | SHT | CAD | DYSLIPIDEMIA | PVD | ALCOHOLISM | SMOKING | FAMILY H/O CAD | BMI | WHR CMS | CKMB UNITS/ML | TROP T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MADURAI | 55 | MALE | COOLIE | NOT EDUCATED | 2 DAYS | NO | NO | NO | NO | NO | OCCASIONAL | NO | NO | 26.7 | 96 | 540 | 143 |
| RANI PREMILA | 64 | FEMALE | FNA | 9TH STD | 12 HRS | 17YRS | 14YRS | UA,I MONTH | NO | NO | NO | NO | NO | 27.4 | 94 | NEGATIVE | NA |
| GOVINDASAMY | 60 | MALE | FARMER | 8TH STD | 5 HRS | NO | 25 YRS | CAD,2 MTHS | NO | NO | EX | EXSMOKER | NO | 23.4 | 94 | NEGATIVE | NA |
| RAJA | 66 | MALE | SECURITY | NOT EDUCATED | 3 DAYS | NO | NO | NO | NO | NO | NO | 15 PACK YRS | NO | 21.7 | 75 | 426 | NA |
| RAJENDRAN | 45 | MALE | FARMER | 10TH STD | 3 DAYS | 1YR,6 MTHS | NO | AWMI,3 MNTHS | NO | NO | NO | NO | NO | 18.3 | 81 | NEGATIVE | NA |
| ELIYAS | 40 | MALE | FARMER | 5TH STD | 2 DAYS | NO | NO | AWMI,3 MNTHS | NO | NO | EX | EXSMOKER | YES,MOTHER | 20.1 | 79 | NEGATIVE | NA |
| VARAVAN | 75 | MALE | BUSINESS | 2ND STD | 12 HRS | 4 YRS | 4YRS | AWMI,11YRS | NO | NO | 30 YRS,180 ML | 25 PACK YRS | NO | 22.1 | 86 | 296 | NA |
| SIVASUBRAMANI | 60 | MALE | ELECTRICIAN | 10 TH STD | 1O HRS | 10 YRS | NO | ASMI,10 YRS | NO | NO | NO | NO | NO | 26.7 | 95 | 567 | NA |
| YESAIYYA | 44 | MALE | WARD BOY | 9TH STD | 3 HRS | NO | 1 YR | IWMI ,15 YRS | NO | NO | EX | EXSMOKER | NO | 21 | 78 | 771 | NA |
| GOVINDARAJ | 46 | MALE | BUSINESS | 8TH STD | 4 HRS | NO | NO | NO | NO | NO | NO | NO | NO | 19.4 | 90 | 296 | NA |
| GANESAN | 42 | MALE | COOLIE | 10 TH STD | 2 DAYS | NO | NO | AWMI,2 MTHS | NO | NO | NO | NO | NO | 25.6 | 101 | NEGATIVE | NA |
| PANDIYAN | 57 | MALE | COOLIE | 2ND STD | 4 DAYS | NO | NO | AWMI,2 MTHS | NO | NO | 10 YRS ,180 ML | EXSMOKER | NO | 18.5 | 80 | NEGATIVE | NA |
| VARADHAN | 57 | MALE | FARMER | 5TH STD | 3 HRS | NO | NO | NO | NO | NO | 1 YR,180 ML | 0.5 PACK YR | NO | 20.8 | 78 | 389 | NA |
| MARIMUTHU | 53 | MALE | MECHANIC | 11TH STD | 2 DAYS | 4 YRS | NO | NO | NO | NO | NO | NO | NO | 26 | 87 | NEGATIVE | NA |
| JOHNY | 55 | MALE | CONTRACTOR | 10TH STD | 4 DAYS | 15 YRS | 8 YRS | NO | NO | NO | EX | EXSMOKER | YES,BROTHER | 25.7 | 101 | NEGATIVE | NA |
| SULOCHANA | 60 | FEMALE | HOME MAKER | 8TH STD | 2 DAYS | 1 YR | 1 YR | NO | NO | NO | NO | NO | NO | 25.3 | 88 | 157 | NA |
| PERUMAL | 56 | MALE | CONDUCTOR | 10TH STD | 4 HRS | 3 YRS | 3 YRS | MI,18 YRS | NO | NO | 25 YRS,90 ML | 12.5 PACK YRS | NO | 23.7 | 100 | 190 | NA |
| RAJA | 41 | MALE | DRIVER | 12TH STD | 3 DAYS | NO | 5 YRS | NO | NO | PVD,LT LL | 15 YRS,180 ML | EXSMOKER | NO | 28.2 | 108 | 534 | NA |
| VENKATESAN | 57 | MALE | COOLIE | 8 TH STD | 3 DAYS | NO | 1 YR | NO | NO | NO | NO | NO | NO | 15.8 | 88 | 516 | NA |
| SURESH | 35 | MALE | ELECTRICIAN | 9TH STD | 6 HRS | NO | NO | ASMI,2 YRS | NO | NO | OCCASIONAL | EXSMOKER | NO | 25.3 | 94 | 250 | NA |
| MUNVARDEEN | 31 | MALE | BUSINESS | 8TH STD | 6 HRS | NO | NO | NO | NO | NO | 10 YRS ,180 ML | 5 PACK YRS | YES,FATHER | 22.9 | 88 | 554 | NA |
| KRISHNAMOORTHY | 72 | MALE | SECURITY | 7TH STD | 3 DAYS | 4YRS | 4 YRS | AWMI,10 YRS | NO | NO | OCCASIONAL | OCCASIONAL | NO | 18.4 | 81 | 560 | NA |
| PALAYAM | 60 | MALE | FARMER | NOT EDUCATED | 4 HRS | NO | NO | NO | NO | NO | NO | EXSMOKER | NO | 18.7 | 87 | 201 | NA |
| VENU | 63 | MALE | PROGITHAR | NOT EDUCATED | 3 DAYS | NO | 4 YRS | NO | NO | NO | NO | NO | NO | 19.5 | 79 | 176 | NA |
| SIVARAMAN | 46 | MALE | OT TECHNICIAN | 10TH STD | 2 DAYS | NO | NO | AWMI, 1 MTH | NO | NO | NO | EXSMOKER | YES,FATHER | 22.6 | 82 | NEGATIVE | NA |
| SHANMUGAM | 58 | MALE | FARMER | 8TH STD | 3 DAYS | NO | NO | CAD,3 YRS | NO | NO | NO | EXSMOKER | NO | 28 | 102 | NEGATIVE | NA |
| RAMESH | 55 | MALE | BOOK SELLER | 8TH STD | 12 HRS | 15 YRS | 15 YRS | NO | NO | NO | 15 YRS,180 ML | 7.5 PACK YRS | NO | 20.4 | 97 | 2509 | NA |
| THANGAVELU | 53 | MALE | SECURITY | 8TH STD | 3 DAYS | NO | NO | NO | NO | NO | EX | EXSMOKER | NO | 24.9 | 99 | NEGATIVE | NA |
| THAMBIYAPILLAI | 51 | MALE | SUB INS | 10 TH STD | 4 DAYS | I YR | 1 YR | NSTEMI,2 MTH | NO | NO | EX | EXSMOKER | NO | 26 | 101 | NEGATIVE | NA |
| KALIYAPERUMAL | 58 | MALE | FIRE SERVICE | 10TH STD | 5 DAYS | 9 YRS | 8 YRS | IWMI 9 YRS | NO | NO | NO | NO | NO | 19.9 | 75 | NEGATIVE | NA |
| SIVARAMAN | 42 | MALE | COOLIE | 5TH STD | 10 DAYS | NO | NO | NO | NO | YES,RT UL | 15 YRS,180 ML | 10 PACK YRS | NO | 23.4 | 90 | NEGATIVE | NA |
| K.R.GOVINDHAN | 46 | MALE | ELECTRICIAN | 7TH STD | 2 HRS | NO | NO | NO | NO | NO | 4 YRS,180 ML | 25 PACK YRS | NO | 27.3 | 98 | 217 | NA |
| VITTABAI | 65 | FEMALE | HOME MAKER | 5TH STD | 1 WEEK | 14 YRS | 7 YRS | YES . 1 YR | NO | NO | NO | NO | NO | 25.8 | 91 | NEGATIVE | NA |
| MUNIYAMMAL | 60 | FEMALE | HOME MAKER | NOT EDUCATED | 6HRS | NO | 3YRS | NO | NO | NO | NO | NO | NO | 26.5 | 96 | 411 | NA |
| MANOHARAN | 50 | MALE | CLEANER | NOT EDUCATED | 8HRS | NO | NO | NO | NO | NO | 15 YRS,90 ML | 7.5 PACK YRS | NO | 16.6 | 72 | 217 | NA |
| RAVI | 42 | MALE | DRIVER | 6TH STD | 3 DAYS | NO | NO | NO | NO | NO | 8 YRS,180 ML | 4 PACK YRS | NO | 20.1 | 76 | 402 | NA |
| RAJAGURU | 49 | MALE | BUSINESS | 7TH STD | 4 HRS | NO | NO | NO | NO | NO | NO | 15 PACK YRS | NO | 23.2 | 82 | 143 | NA |
| MUBHARAKKHAN | 48 | MALE | ELECTRICIAN | 5TH STD | 1 DAY | NO | NEW | YES,6 YRS | NO | NO | NO | 15 PACK YRS | YES,FATHER | 26 | 86 | NEGATIVE | NEGATIVE |
| SANTHANAM | 54 | MALE | LOAD MAN | NOT EDUCATED | 2 DAYS | 3 MONTHS | 10 YRS | YES,3 YRS | NO | NO | EX | EXSMOKER | NO | 24.7 | 98 | NEGATIVE | NA |
| GOVINDASAMY | 50 | MALE | FARMER | 10TH STD | 3 DAYS | NO | NO | UA,I MONTH | NO | NO | NO | NO | NO | 21 | 82 | NEGATIVE | NA |
| CHANDRASEKAR | 66 | MALE | SUPERVISOR | 10 TH STD | 2 DAYS | NEW | NO | NO | NO | NO | NO | NO | NO | 24.8 | 94 | 164 | NA |
| BALAKRISHNAN | 74 | MALE | PVC | 10TH STD | 6 DAYS | NO | NO | CAD,6 YRS | NO | NO | NO | NO | NO | 28.5 | 102 | NEGATIVE | NA |
| RAJAGOPAL | 58 | MALE | BUSINESS | 10TH STD | 5 DAYS | NO | 20 YRS | MI,9 MTHS | NO | NO | NO | NO | NO | 18.7 | 79 | NEGATIVE | NA |
| MEHABUBASHA | 54 | MALE | BIDI ROLLER | NOT EDUCATED | 3 DAYS | NO | NO | NO | NO | NO | OCCASIONAL | 15 PACK YRS | NO | 21.4 | 80 | 518 | NA |
| VENKATESAN | 42 | MALE | CONTRACTOR | 8TH STD | 5 HRS | NO | NO | RHD,MS,MR | NO | NO | OCCASIONAL | EXSMOKER | NO | 21.4 | 87 | 847 | NA |
| ASAITHAMBI | 60 | MALE | BUSINESS | 8 TH STD | 4 HRS | NO | NO | NO | NO | NO | NO | NO | NO | 24.4 | 91 | 145 | NA |
| SELVABALAJI | 27 | MALE | DRIVER | 9 TH STD | 1 DAY | NO | NO | CAD,2 WKS | NO | NO | NO | 10 PACK YRS | NO | 22.7 | 90 | 230 | NA |
| VIJAYAKUMAR | 48 | MALE | MED.REP | BSC | 4 DAYS | 2 YRS | NO | NO | NO | NO | 20 YRS,180 ML | 15 PACK YRS | NO | 22 | 84 | 421 | NA |
| KALIMUTHU | 48 | MALE | TEA SHOP | NOT EDUCATED | 6 HRS | NO | NO | NO | NO | NO | OCCASIONAL | OCCASIONAL | NO | 26 | 88 | 500 | NA |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SUBRAMANI | 62 | MALE | COOLIE | 3RD STD | 2 DAYS | NO | NO | NO | NO | NO | 15 YRS,180 ML | 7.5 PACK YRS | NO | 23.9 | 102 | NEGATIVE | NA |
| THULASINGHAM | 66 | MALE | SECURITY | 8TH STD | 1 DAY | NO | NO | NO | NO | NO | NO | NO | NO | 24.3 | 88 | NEGATIVE | NA |
| MANJULA | 48 | FEMALE | HOME MAKER | 8 TH STD | 8 HRS | 6 MONTHS | 6 MONTHS | YES,6 MTHS | NO | NO | NO | NO | NO | 34.8 | 108 | NEGATIVE | NA |
| GOWRI | 55 | FEMALE | HOME MAKER | 8 TH STD | 2 DAYS | 10 YRS | 10 YRS | IWMI,6 MTHS | NO | YES | NO | NO | YES,MOTHER | 26.4 | 93 | NEGATIVE | NA |
| OMANIAMMAL | 62 | FEMALE | HOME MAKER | 10 STD | 1 DAY | 23 YRS | 9 YRS | IPMI,9 YRS | NO | NO | NO | NO | YES , MOTHER | 25.2 | 86 | NEGATIVE | NA |
| DHARMALINGAM | 52 | MALE | FARMER | 3RD STD | 3 DAYS | NO | NO | PCI, LAD,I MTH | NO | NO | 10 YRS ,180 ML | 5 PACKYRS | NO | 19.3 | 76 | 253 | NA |
| RAMADOSS | 64 | MALE | FARMER | 10TH STD | 2 DAYS | 3 MONTHS | NO | AWMI,1 WK | NO | NO | 15YRS,180ML | 15 PACK YRS | NO | 25.9 | 94 | NEGATIVE | NA |
| KUMAR | 63 | MALE | IRONING | 5 TH STD | 7 DAYS | 10 YRS | 1 YR | UA,2 MONTH | NO | NO | NO | NO | NO | 20.3 | 94 | NEGATIVE | NA |
| BABU | 50 | MALE | TEA SHOP | 1ST STD | 3 DAYS | NO | 1 YR | UA, 3 MTHS | NO | NO | NO | 25 PACK YRS | NO | 25.4 | 103 | NEGATIVE | NA |
| SARAVANAN | 42 | MALE | DRIVER | 10 TH STD | 2 DAYS | 1YR,6 MTHS | NO | IPMI,14 MTHS | NO | NO | OCCASIONAL | 5 PACK YRS | NO | 23 | 94 | NEGATIVE | NA |
| MOORTHY | 45 | MALE | DRIVER | 6 TH STD | 2 DAYS | NO | NO | AWMI,2 YRS | NO | NO | OCCASIONAL | 20 PACK YRS | NO | 20.4 | 96 | NEGATIVE | NA |
| KATHAVARAYAN | 52 | MALE | HEALTH INS | 8 TH STD | 5 DAYS | NO | NO | IPMI,3 MTHS | NO | NO | NO | NO | NO | 26 | 92 | NEGATIVE | NA |
| MOHAMMED IMRAN | 56 | MALE | MECHANIC | 10 TH STD | 3 DAYS | 3 YRS | NO | AWMI,,I MTH | NO | NO | NO | 15 PACK YRS | NO | 28.1 | 101 | NEGATIVE | NA |
| BALAMURUGAN | 43 | MALE | DRIVER | 10 TH STD | 2 DAYS | NO | 6 MONTHS | NSTEMI,1 MTH | NO | NO | OCCASIONAL | OCCASIONAL | NO | 25.7 | 102 | NEGATIVE | NA |
| BALAKRISHNAN | 56 | MALE | TEXTILES | 10TH STD | 4 DAYS | NO | 15 YRS | NO | NO | NO | NO | NO | YES,MOTHER | 35.3 | 86 | NEGATIVE | NA |
| VARADHACHARI | 71 | MALE | CARPENTER | NOT EDUCATED | 1 DAY | NO | NO | NO | NO | NO | NO | NO | NO | 24.8 | 94 | 352 | 1494 |
| JEGADEESAN | 54 | MALE | CONTRACTOR | 5TH STD | 3 DAYS | NO | 6 MONTHS | MI,6 MTHS | NO | NO | OCCASIONAL | 15 PACK YRS | YES,MOTHER | 20.6 | 67 | NEGATIVE | NA |
| HUSSAIN | 27 | MALE | MECHANIC | 5TH STD | 3 DAYS | NO | NEW | NO | NO | NO | NO | NO | NO | 23.4 | 92 | NEGATIVE | NA |
| CHINNASAMY | 70 | MALE | MECHANIC | NOT EDUCATED | 4 DAYS | NEW | NEW | NO | NO | NO | 15 YRS,180 ML | 10 PACK YRS | NO | 19.1 | 80 | NEGATIVE | NA |
| SRINIVASAN | 53 | MALE | BUSINESS | 10TH STD | 3 DAYS | 2 YRS | 2 YRS | HYPOTHYROID | NO | NO | NO | NO | YES,MOTHER | 22.6 | 86 | NEGATIVE | NA |
| GURUSAMY | 53 | MALE | FARMER | 10TH STD | 2 DAYS | NO | NO | AWMI,3 MNTHS | NO | NO | NO | NO | NO | 18 | 71 | NEGATIVE | NA |
| NATARAJAN | 57 | MALE | TAILOR | 8TH STD | 15 HRS | 15 YRS | 1 YR | NO | NO | NO | NO | NO | YES,FATHER,MOTHER | 26.7 | 104 | NEGATIVE | NA |
| HARIKRISHNAN | 62 | MALE | APPRAISER | BSC.MATHS | 4 HRS | 1YR,6 MTHS | NO | NO | NO | NO | NO | EXSMOKER | NO | 24.9 | 76 | 23 | NA |
| ARUMUGAM | 36 | MALE | BUSINESS | 9TH STD | 6 HRS | 4 YRS | 4YRS | NO | NO | NO | EX | EXSMOKER | YES,MOTHER | 28 | 100 | 522 | NA |
| SIVANESAN | 54 | MALE | BUSINESS | 10TH STD | 5 DAYS | 8 YRS | 8 YRS | AWMI,5 YRS | NO | NO | EX | EXSMOKER | YES,FATHER | 26.3 | 111 | NEGATIVE | NA |
| MANJAPPAN | 44 | MALE | SECURITY | 12TH STD | 2 DAYS | NO | NO | NO | NO | NO | 10 YRS ,180 ML | 15 PACK YRS | NO | 24.5 | 96 | 139 | NA |
| DAMODHARAN | 70 | MALE | PROGITHAR | 8TH STD | 2 HRS | 11 YRS | 3 YRS | YES,3 MTHS | NO | NO | NO | NO | NO | 23.7 | 98 | NEGATIVE | NA |
| EGAMBARAM | 60 | MALE | STATIONERIES | 7 TH STD | 2 DAYS | NO | NO | YES . 1 YR | NO | NO | NO | 2 PACK YRS | NO | 18 | 78 | NEGATIVE | NA |
| FRANCIS | 65 | MALE | GOVT,EMPLOYE | 8TH STD | 2 DAYS | NO | NO | NO | NO | NO | EX | EXSMOKER | NO | 23.4 | 101 | NEGATIVE | NA |
| RAMAMOORTHY | 42 | MALE | BUSINESS | 8 TH STD | 3 DAYS | NO | NEW | AWMI,1 MTH | NO | NO | NO | NO | NO | 28 | 94 | NEGATIVE | NA |
| KANNIYAMMAL | 50 | FEMALE | HOME MAKER | 5TH STD | 2 DAYS | NEW | NEW | CA,CX | NO | NO | NO | NO | YES,MOTHER | 26.9 | 93 | NEGATIVE | NA |
| PACHAIYAPPAN | 52 | MALE | COOLIE | 5TH STD | 2 HRS | 3 YRS | 1 YR | NO | NO | NO | EX | EXSMOKER | NO | 26.9 | 102 | 103 | NA |
| JEYASEELAN | 45 | MALE | AUTO DRIVER | 9TH STD | 3 HRS | NO | 1 YR,NO DRUGS | NO | NO | NO | 3YRS,180ML | NO | YES,FATHER | 19.6 | 98 | 179 | NA |
| JAMILABEE | 60 | FEMALE | HOME MAKER | NOT EDUCATED | 6 HRS | NO | 3 YRS | NO | NO | NO | NO | NO | NO | 23.7 | 96 | 607 | NA |
| MOORTHY | 45 | MALE | BUSINESS | 9TH STD | 6 HRS | NO | NO | NO | NO | NO | OCCASIONAL | OCCASIONAL | YES,FATHER,SISTER | 30.3 | 92 | 2001 | NA |
| EKKAMMAL | 70 | FEMALE | COOLIE | NOT EDUCATED | 1 DAY | NO | NO | NO | NO | NO | NO | NO | NO | 22.1 | 79 | 365 | NA |
| MOIDEEN BASHA | 64 | MALE | STORE KEEPER | 10TH STD | 2 DAYS | 5YRS | 5YRS | YES,6 YRS | NO | NO | NO | NO | NO | 25.7 | 88 | NEGATIVE | NA |
| SEKAR | 62 | MALE | TEA SHOP | 4TH STD | 4 HRS | NO | 4 YRS | NO | NO | NO | 30 YRS | 30 PACK YRS | NO | 22.9 | 96 | NEGATIVE | NA |
| SURESH | 38 | MALE | REP | 8TH STD | 12 HRS | NO | NO | NO | NO | NO | YES,5 YRS | 5YRS | NO | 21 | 97 | NEGATIVE | NA |
| PANNEER SELVAM | 27 | MALE | BUSINESS | 5TH STD | 1 DAY | NO | NO | NO | NO | NO | OCCASIONAL | 1.5 PACK YRS | NO | 17.9 | 74 | 129 | NA |
| PATCHAIPILLAI | 56 | MALE | FARMER | 8 TH STD | 4 DAYS | NO | NO | NO | NO | NO | OCCASIONAL | NO | NO | 25.1 | 102 | NEGATIVE | NA |
| SADHASIVAM | 80 | MALE | BUSINESS | 5TH STD | 7 DAYS | NO | NO | NO | NO | N | NO | NO | NO | 24 | 98 | NEGATIVE | NA |
| NAGARAJAN | 48 | MALE | BUSINESS | 12TH STD | 4 DAYS | NO | 4 YRS | IW,RVMI,6 MTS | NO | NO | NO | EXSMOKER | NO | 38.6 | 88 | NEGATIVE | NA |
| RAJASEKAR | 49 | MALE | MECHANIC | 10TH STD | 4 DAYS | NO | 15 YRS | UA,3 MTHS | NO | NO | 10 YRS ,180 ML | 5 PACK YRS | YES,FATHER | 25.5 | 93 | NEGATIVE | NA |
| NAGARAJAN | 56 | MALE | BUSINESS | 12TH STD | 4 DAYS | NO | NEW | IWMI,6 MTHS | NO | NO | NO | EXSMOKER | NO | 29.5 | 107 | 721 | NA |
| MANOHARAN | 43 | MALE | COOLIE | 10TH STD | 2 DAYS | NO | NO | NO | NO | NO | OCCASIONAL | NO | NO | 17 | 66 | NEGATIVE | NA |
| JAMES | 53 | MALE | DRIVER | 11TH STD | 6 DAYS | 5 YRS | 5 YRS | MI,6 MTHS | NO | NO | EX | EXSMOKER | NO | 26.6 | 103 | NEGATIVE | NA |
| ANNAMALAI | 60 | MALE | FARMER | 10TH STD | 2 DAYS | 6 YRS | 6YRS | IWMI,1 MTH | NO | NO | NO | NO | NO | 31.8 | 108 | 786 | NA |
| DINAKARAN | 54 | MALE | FARMER | 10TH STD | 5 DAYS | NO | NO | NO | NO | NO | 20 YRS,180 ML | 15 PACK YRS | NO | 17.1 | 86 | NEGATIVE | NA |
| GANESAN | 52 | MALE | COOLIE | 8TH STD | 5 DAYS | 10 YRS | NO | CABG, 10 YRS | NO | NO | 25 YRS,180 ML | 15 PACK YRS | NO | 27 | 105 | NEGATIVE | NA |
| BABYAMMAL | 76 | FEMALE | HOME MAKER | 3RD STD | 14 HRS | 6 MONTHS | 6 MONTHS | NO | NO | NO | NO | NO | NO | 24.9 | 91 | 250 | NA |
| **Total** | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | 23.876 | 90.75 | | |

| TOTAL CHOLESTEROL MG/DL | TGL MG/DL | LDL MG/DL | HDL MG/DL | ECG | ECHO | EF % | MR | COMPLICATIONS | TMT | ANGIO | PCI | CABG | DEATH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 148 | 72 | NA | NA | STEMI AWMI,VT | MOD LV DYSFN,GRADE 2 DD | 42 | NO | VT | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA,OLD AWMI | MODERATE LV DYSFN,GRADE 2 DD | 40 | NO | | NA | LAD 90,LCX 90,RCA 90 | NA | CABG | |
| NA | NA | NA | NA | UA | MODERATE LV DYSFUNCN,GRADE 2 DD | 40 | TRIVIAL MR | FAILURE | NA | NA | NA | NA | |
| NA | NA | NA | NA | NSTEMI ,AWMI | MODERATE LV DYSFN,GRADE 2 DD | 38 | MOD MR,AV SCLEROSIS | FAILURE | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA,OLDAWMI | MOD LV SYST DYSFN,GRADE 2 DD | 43 | NO | NO | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA,OLD AWMI | MOD LV DYSFN,GRADE 2 DD | 44 | TRIVIAL MR | NO | NA | DVD | NA | NA | |
| 148 | 112 | 142 | 38 | NSTEMI | MOD LV DYSFN,GRADE 2 DD | 40 | AV SCLEROSIS,MILD MR | FAILURE | NA | NA | NA | NA | |
| 141 | 64 | NA | NA | STEMI,AWMI,AF | MOD LV DYSFN,GRADE 1 DD | 38 | MILD MR | AF | NA | NA | NA | NA | |
| 233 | 123 | NA | NA | STEMI AWMI,OLD IW | MOD LV DYSFN ,GRADE 1 DD | 40 | NO | | NA | TVD | NA | CABG | |
| 155 | 142 | NA | NA | STEMI,AWMI | MOD.LV DYSFN,GRADE 1DD | 43 | NO | NO | NA | NORMAL STUDY | NA | NA | |
| NA | NA | NA | NA | UA,OLD IWMI | MOD LV DYSFN ,GRADE 1 DD | 37 | NO | | NA | SVD | NA | CABG DONE | |
| NA | NA | NA | NA | UA,OLD AWMI | MOD LV DYSFN,GRADE 1 DD | 34 | MILD MR | | NA | NA | NA | NA | DIED |
| 140 | 90 | NA | NA | NSTEMI AWMI | MOD LV DYSFN ,GRADE 1 DD | 41 | MILD TR,PTB | NO | NA | NA | NA | NA | |
| 166 | 92 | NA | NA | UA | MOD. LV DYSFN, GRADE 1 DD | 42 | NO | | NA | DVD | PTCA | NA | |
| NA | NA | NA | NA | UA | MOD.LV DYSFN,GRADE 1DD | 37 | NO | FAILURE | NA | NA | NA | NA | |
| 178 | 155 | NA | NA | NSTEMI | MOD.SYST.DYSFN,GRADE 1 DD | 38 | NO | | NA | NA | NA | NA | |
| 172 | 140 | NA | NA | STEMI,AWMI | MODERATE LV DYSFN,GRADE 3 DD | 36 | NO | FAILURE | NA | NA | NA | NA | |
| 168 | 152 | NA | NA | STEMI,ALMI | MODERATE LV DYSFN | 39 | NO | FAILURE,PVD | NA | NORMAL STUDY | NA | NA | |
| NA | NA | NA | NA | STEMI,ASMI | MOD LV DYSFN | 35 | NO | NO | NA | NA | NA | NA | |
| 210 | 125 | NA | NA | STEMI,ASMI | MOD LV DYSFN | 40 | NO | | NA | SVD | PTCA | NA | |
| 169 | 164 | NA | NA | STEMI,AWMI, | MOD LV DYSFN | 38 | NO | NO | NA | NA | NA | NA | |
| NA | NA | NA | NA | IP,RVMI,OLD AWMI | MOD LV DYSFN,MILD RV DYSFN | 37 | MILD MR,AV SCLEROSIS | FAILURE | NA | NA | NA | NA | |
| 145 | 62 | NA | NA | STEMI,IWMI | MOD LV DYSFN | 40 | TRIVIAL TR | | NA | NA | NA | NA | |
| 158 | 120 | NA | NA | STEMI,AWMI | MOD.LV DYSFN | 38 | TRIV. MR,AV SCLEROSIS,MR | NO | NA | NA | NA | NA | DIED |
| NA | NA | NA | NA | UA | MOD LV DYSFN,GRADE 3 DD | 36 | MILD MR | FAILURE | NA | NORMAL STUDY | NA | NA | |
| NA | NA | NA | NA | UA,OLD AWMI | MOD LV DYSFN,GRADE 3 DD | 33 | DCM,MR | FAILURE | NA | TVD | NA | NA | |
| 200 | 96 | NA | NA | NSTEMI ,ASMI | MODERATE LV DYSFNCN | 33 | MR MODERATE | FAILURE | NA | TVD | NA | NA | |
| NA | NA | NA | NA | UA | MOD LV DYSFN | 37 | MOD AS,MOD AR | | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA | MOD LV DYSFN | 41 | MOD MR,DCM | VT ILL SUST | NA | LCX 60,RCA 90 | NA | NA | DIED |
| NA | NA | NA | NA | UA,OLD IWMI | MOD LV DYSFN | 32 | TRIVIAL MR | | NA | TVD | NA | NA | |
| 100 | NA | NA | NA | UA | MOD LV DYSFN | 40 | TRIVIAL MR | | NA | NA | NA | NA | |
| 162 | 98 | NA | NA | W GRADE 2 DD,ADEQ | GRADE 2 DD,NORMAL SYST.FUNCN | 58 | NO | UA | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA | NORMAL LV FUNCN,GRADE 2DD | 58 | NO | NO | STRONGLY +VE | LAD,70,PROX RCA 70 | NA | NA | |
| 149 | 72 | NA | NA | GRADE 2 DD,AD | GRADE 1 DD,NORMAL SYST.FUNCN, | 57 | NO | PULM,EDEMA | NA | TVD | NA | NA | |
| 165 | 112 | NA | NA | STEMI,IW,PW,LW | NORMAL LV FUNCN,GRADE 1 DD | 69 | NO | | NA | NA | NA | NA | |
| 146 | 86 | NA | NA | STEMI,IWMI | NORMAL LV FUNCN,GRADE 1 DD | 58 | NO | | NA | NA | NA | NA | |
| 148 | 79 | NA | NA | STEMI,IWMI | NORMAL LV FN,GRADE 1 DD | 62 | TRIVIAL MR | | NA | NA | NA | NA | |
| 168 | 131 | NA | 40 | UA | NORMAL LV FUNCN,GRADE 1 DD | 56 | NO | NO | STRONGLY +VE | PROX.LAD(90),DISTAL RCA(60) | PROXLAD | NA | |
| NA | NA | NA | NA | UA | NORMAL LV FUNCN,GRADE 1DD | 62 | MILD | NO | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA | NORMAL LV FUNCN, GRADE 1 DD | 61 | NO | | NA | TVD | NA | NA | |
| 141 | 92 | NA | NA | NSTEMI AWMI | NORMAL LV FUNCN,GRADE 1 DD | 60 | MILD MR, AV SCLEROSIS | | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA | NORMAL SYST FUNCN,GRADE 1 DD | 58 | NO | NO | NA | NA | NA | NA | DIED |
| 143 | 102 | NA | NA | UA,OLD AWMI | NORMAL SYST.FUNCN,GRADE 1 DD | 67 | TRIVIAL MR | SA NODE DYSFN | NA | NA | NA | NA | |
| NA | NA | NA | NA | STEMI,IW,PW,RVMI | NORMAL SYST.FUNCN,NO DD | 56 | NO | NO | NA | NA | NA | NA | |
| 148 | 139 | NA | NA | STEMI,RBBB,IWMI | NORMAL LV FUNCN | 60 | MS,MR,AR,MOD PHT | | NA | NA | NA | NA | |
| 164 | 80 | NA | NA | STEMI,IW,PW,RVMI | NORMAL LV FUNSN | 55 | TRIVIAL MR | | NA | NA | NA | NA | |
| 170 | NA | NA | NA | STEMI , ALMI | NORMAL LV FUNCN | 65 | NO | | NA | MID LAD 70 | NA | NA | |
| 205 | 81 | NA | NA | STEMI,IWMI | NORMAL LV FN | 60 | RHD,MS,MR | | NA | NA | NA | NA | |
| 156 | 125 | NA | NA | IW,PWMI | NORMAL LV FN | 64 | NO | NO | NA | NA | NA | NA | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NA | NA | NA | NA | UA | NORMAL SYST. FUNCN | 67 | NO | UA | NA | LAD,50,PROX RCA 70 | NA | NA | |
| NA | NA | NA | NA | UA,LBBB | NORMAL SYST. FUNCN | 58 | NO | | NA | LAD 50,RCA 50 | NA | NA | |
| 149 | 105 | NA | NA | OLD IWMI,UA | NORMAL LV SYST.FUNCN | 65 | NO | AF | NA | NORMAL STUDY | NA | NA | |
| NA | NA | NA | NA | UA,OLD IWMI | NORMAL LV FUNCN | 65 | NO | | NA | SVD | NA | NA | |
| NA | NA | NA | NA | UA,OLD IPMI | NORMAL LV FUNCN | 55 | NO | | NA | TVD | NA | NA | |
| 149 | 151 | NA | NA | NSTEMI IWMI | NORMAL LV FUNCTION | 60 | NO | | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA | NORMAL LV FUNCN | 60 | NO | | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA,CHB,PPI | NORMAL LV FUNCTION | 62 | TRIVIAL MR | CHB,PPI | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA | NORMAL LV FUNCN | 60 | NO | UA | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA | NORMAL LV FUNCN | 71 | TRIVIAL MR | | NA | DVD | NA | NA | |
| NA | NA | NA | NA | UA | NORMAL LV FUNCN | 60 | NO | | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA,OLD IWMI | NORMAL LV FUNCN | 68 | NO | | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA,OLD AWMI | NORMAL LV FUNCN | 57 | NO | | NA | SVD | PTCA | NA | |
| NA | NA | NA | NA | UA | NORMAL LV FUNCN | 58 | NO | | NA | TVD | PTCA | NA | |
| NA | NA | NA | NA | UA | NORMAL LV FUNCTION | 62 | NO | | POSITIVE | DVD | PTCA | NA | |
| NA | NA | NA | NA | NSTEMI IP,LWMI | NORMAL LV FUNCN | 65 | NO | | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA | NORMAL SYST. FUNCN | 60 | TRIVIAL MR | | NA | LCX 70,RCA 95 | PTCA | NA | |
| NA | NA | NA | NA | UA | NORMAL LV FUNCN | 56 | NO | NO | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA | NORMAL LV FN | 58 | NO | NO | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA | NORMAL LV FUNCN | 59 | NO | | POSITIVE | DVD | NA | NA | |
| NA | NA | NA | NA | UA | NORMAL LV FN | 60 | AV SCLEROSIS,MILD AR | | NA | TVD | PTCA | NA | |
| NA | NA | NA | NA | UA | NORMAL LV FUNCTION | 70 | NO | | NA | SVD | NA | NA | |
| 224 | 134 | 154 | 43 | STEMI,ANT.WALL | MILD LV SYST.DYSFUNCN,GRADE 2 DD | 47 | NO | UA | NA | DVD | NA | NA | |
| 245 | 181 | NA | NA | STEMI,AWMI | MILD SYST. DYSFN,GRADE 2 DD | 47 | RV DILATED | | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA,OLD AWMI | MILD LV DYSFN,GRADE 2 DD | 46 | NO | NO | NA | NA | NA | NA | |
| 152 | 145 | NA | NA | STEMI,ASMI | MILD LV DYSFN.GRADE 1 DD | 49 | NO | | NA | SVD | PTCA | NA | |
| NA | NA | NA | NA | UA | MILD LV DYSFUNCN,GRADE 1 DD | 45 | AV SCLEROSIS,MILD MR,AR | UA | NA | TVD | NA | NA | |
| NA | NA | NA | NA | UA,OLD IWMI | MILD LV SYST.DYSSFUNCN,GRADE 1 DD | 50 | NO | | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA,LBBB | MILD LV DYSFN , GRADE 1 DD | 55 | NO | NO | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA | MILD LV DYSFN,GRADE 1 DD | 47 | NO | NO | NA | NA | NA | NA | |
| 177 | 106 | NA | NA | UA | MILD LV DYSFN,GRADE 1 DD | 50 | NO | | NA | DVD | NA | NA | |
| 154 | 183 | NA | NA | STEMI,AWMI | MILD LV DYSFN , GRADE 3 DD | 52 | MILD MR,MILD TR,MILD AR | FAILURE | NA | NA | NA | NA | |
| 109 | NA | NA | 41 | STEMI,IW,PW | MILD LV SYST.DYSFUNCN,NO DD | 52 | NO | NO | NA | NA | NA | NA | |
| 128 | 216 | NA | NA | STEMI,IWMI,PW | MILD LV DYSFN,NO DD | 46 | MILD MR, AV SCLEROSIS | MOBITZ TYPE 2 BK | NA | NA | NA | NA | |
| 148 | 250 | NA | NA | STEMI,AWMI | MILD SYST. DYSFN | 52 | NO | | NA | NA | NA | NA | |
| 128 | 94 | NA | NA | IWMI,RVMI,CHB | MILD LV DYSFN | 53 | AV SCLEROSIS,MILD TR | CHB,PPI | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA | MILD LV DYSFUNCN | 50 | NO | NO | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA | MILD LV DYSFNCN,DCM | 45 | TRIVIAL,AR + | DCM | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA | MILD SYST.DYSFNCN | 49 | NO | | NA | NA | NA | NA | |
| 143 | 68 | NA | NA | NSTEMI AWMI | MILD SYST. DYSFN | 54 | NO | NO | NA | NA | NA | NA | |
| 518 | 152 | NA | NA | UA,LBBB | MILD LV DYSFN,NO DD | 45 | TRIVIAL MR | UA | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA | MILD LV DYSFN | 45 | TRIVIAL MR | | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA | MILD LV DYSFN | 50 | NO | | NA | SVD | NA | NA | |
| NA | NA | NA | NA | UA | MILD LV DYSFN | 50 | NO | NO | NA | NA | NA | NA | |
| 209 | 164 | NA | NA | NSTEMI,ASMI | MILD LV DYSFN | 48 | MILD MR | NO | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA | MILD LV DYSFN | 46 | NO | NO | NA | SVD | NA | NA | |
| NA | NA | NA | NA | UA,LBBB | MILD SYST. DYSFN | 50 | NO | NO | NA | DVD | NA | NA | |
| 180 | 152 | 110 | 40 | NSTEMI IWMI | MILD LV DYSFN | 50 | NO | | NA | LAD 50,RCA 50 | NA | NA | |
| NA | NA | NA | NA | UA,LBB,LVH | SEVERE LV DYSFUNCTION,GRADE 2 DD | 30 | MR MOD -SEVERE,TR MILD ,L | DCM,AF | NA | NA | NA | NA | |
| NA | NA | NA | NA | UA | SEVERE LV DYSFUNCTION,GRADE 3 DD | 30 | MILD MR, MOD PHT | DCM | NA | LAD 90,LCX 90 | NA | CABG, 10 YRS | DIED |
| 158 | 121 | NA | NA | NSTEMI | SEVERE LV DYSFN,GRADE 3 DD | 30 | NO | FAILURE,DCM | NA | NA | NA | NA | |
| | | | | | | | | | | | | | **5** |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